PHASE I INITIAL SITE INVESTIGATION REPORT

ATF DAVIDSON
1 MAIN STREET
WHITINSVILLE, MASSACHUSETTS

RTN 2-0111

MARCH 1997

PREPARED BY

NEAL M. DRAWAS, LSP
KROLL ASSOCIATES, INC.
900 THIRD AVENUE
NEW YORK, NEW YORK 10022

Massachusetts Department of Environmental Protection — BWSC-108
Bureau of Waste Site Cleanup

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

Release Tracking Number: 2 - 0000111

RECEIVED
DEC 12 1997
DEP
CENTRAL REGION

A. SITE LOCATION:

Site Name: (optional) ATF Davidson

Street: 355 Main Street — Location Aid: opposite Arcade Pond

City/Town: Northbridge — ZIP Code: 01588

Related Release Tracking Numbers that this Form Addresses:

Tier Classification: (check one of the following) ☐ Tier IA ☐ Tier IB ☐ Tier IC ☒ Tier II ☐ Not Tier Classified

If a Tier I Permit has been issued, state the Permit Number: Reclassification of Default Tier IB

B. THIS FORM IS BEING USED TO: (check all that apply)

☒ Submit a **Phase I Completion Statement**, pursuant to 310 CMR 40.0484 (complete Sections A, B, C, G, H, I and J).

☐ Submit a **Phase II Scope of Work**, pursuant to 310 CMR 40.0834 (complete Sections A, B, C, G, H, I and J).

☐ Submit a final **Phase II Comprehensive Site Report and Completion Statement**, pursuant to 310 CMR 40.0836 (complete Sections A, B, C, D, G, H, I and J).

☐ Submit a **Phase III Remedial Action Plan and Completion Statement**, pursuant to 310 CMR 40.0862 (complete Sections A, B, C, G, H, I and J).

☐ Submit a **Phase IV Remedy Implementation Plan**, pursuant to 310 CMR 40.0874 (complete Sections A, B, C, G, H, I and J).

☐ Submit an **As-Built Construction Report**, pursuant to 310 CMR 40.0875 (complete Sections A, B, C, G, H, I and J).

☐ Submit a **Phase IV Final Inspection Report and Completion Statement**, pursuant to 310 CMR 40.0878 and 40.0879 (complete Sections A, B, C, E, G, H, I and J).

☐ Submit a periodic **Phase V Inspection & Monitoring Report**, pursuant to 310 CMR 40.0892 (complete Sections A, B, C, G, H, I and J).

☐ Submit a final **Phase V Inspection & Monitoring Report and Completion Statement**, pursuant to 310 CMR 40.0893 (complete Sections A, B, C, F, G, H, I and J).

You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

C. RESPONSE ACTIONS:

☐ Check here if any response action(s) that serves as the basis for the Phase submittal(s) involves the use of Innovative Technologies. (DEP is interested in using this information to create an Innovative Technologies Clearinghouse.)

Describe Technologies:

D. PHASE II COMPLETION STATEMENT:

Specify the outcome of the Phase II Comprehensive Site Assessment:

☐ Additional Comprehensive Response Actions are necessary at this Site, based on the results of the Phase II Comprehensive Site Assessment.

☐ The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class B Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ Rescoring of this Site using the Numerical Ranking System is necessary, based on the results of the final Phase II Report.

E. PHASE IV COMPLETION STATEMENT:

Specify the outcome of Phase IV activities:

☐ Phase V operation, maintenance or monitoring of the Comprehensive Response Action is necessary to achieve a Response Action Outcome. (This site will be subject to a Phase V Operation, Maintenance and Monitoring Annual Compliance Fee.)

☐ The requirements of a Class A Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

SECTION E IS CONTINUED ON THE NEXT PAGE

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Release Tracking Number: 2 - 0000111

E. PHASE IV COMPLETION STATEMENT: (continued)

☐ The requirements of a Class C Response Action Outcome have been met. Further operation, maintenance or monitoring of the remedial action is necessary to ensure that conditions are maintained and that further progress is made toward a Permanent Solution. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

Indicate whether the operation and maintenance will be Active or Passive. (Active Operation and Maintenance is defined at 310 CMR 40.0006.):

○ Active Operation and Maintenance ○ Passive Operation and Maintenance

(Active Operation and Maintenance makes the Site subject to a Post-RAO Class C Active Operation and Maintenance Annual Compliance Fee.)

F. PHASE V COMPLETION STATEMENT:

Specify the outcome of Phase V activities:

☐ The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class C Response Action Outcome have been met. Further operation, maintenance or monitoring of the remedial action is necessary to ensure that conditions are maintained and that further progress is made toward a Permanent Solution. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

Indicate whether the operation and maintenance will be Active or Passive. (Active Operation and Maintenance is defined at 310 CMR 40.0006.):

○ Active Operation and Maintenance ○ Passive Operation and Maintenance

(Active Operation and Maintenance makes the Site subject to a Post-RAO Class C Active Operation and Maintenance Annual Compliance Fee.)

G. LSP OPINION:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with the information contained in this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

> ***if Section B indicates that a Phase I, Phase II, Phase III, Phase IV or Phase V Completion Statement is being submitted***, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> ***if Section B indicates that a Phase II Scope of Work or a Phase IV Remedy Implementation Plan is being submitted***, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> ***if Section B indicates that an As-Built Construction Report or a Phase V Inspection and Monitoring Report is being submitted***, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

☐ Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

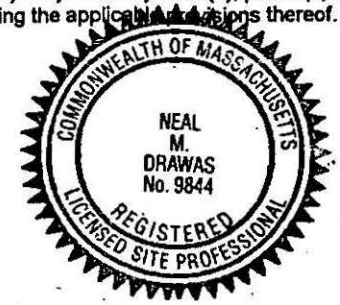
LSP Name: Neal M. Drawas LSP #: 9844 Stamp:

Telephone: 508-443-1833 Ext.:

FAX: (optional) 508-443-1929

Signature:

Date: March 7, 1997



Massachusetts Department of Environmental Protection **BWSC-108**
Bureau of Waste Site Cleanup

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

Release Tracking Number: 2 - 0000111

H. PERSON UNDERTAKING RESPONSE ACTION(S):

Name of Organization: Arcade Realty Trust

Name of Contact: Leonard Jolles Title: Property Mgr.

Street: 1 Main Street

City/Town: Whitinsville (Northbridge) State: MA ZIP Code: 01588

Telephone: 508-234-6301 Ext.: _____ FAX: (optional) _____

☐ Check here if there has been a change in the person undertaking the Response Action.

I. RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE ACTION(S): (check one)

☒ RP or PRP Specify: ⊗ Owner ○ Operator ○ Generator ○ Transporter Other RP or PRP: _____

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Any Other Person Undertaking Response Action Specify Relationship: _____

J. CERTIFICATION OF PERSON UNDERTAKING RESPONSE ACTION(S):

I, Leonard Jolles, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: _____ Title: Property Mgr.
(signature)

For: Arcade Realty Trust Date: _____
(print name of person or entity recorded in Section H)

Enter address of the person providing certification, if different from address recorded in Section H:

Street: same

City/Town: _____ State: _____ ZIP Code: _____

Telephone: _____ Ext.: _____ FAX: (optional) _____

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

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Related Release Tracking Numbers that this Form Addresses:

Tier Classification: (check one of the following) ☐ Tier IA ☐ Tier IB ☐ Tier IC ☒ Tier II ☐ Not Tier Classified

If a Tier I Permit has been issued, state the Permit Number: Reclassification of Default Tier IB

B. THIS FORM IS BEING USED TO: (check all that apply)

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☐ Submit a **Phase III Remedial Action Plan and Completion Statement**, pursuant to 310 CMR 40.0862 (complete Sections A, B, C, G, H, I and J).

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☐ Submit a **Phase IV Final Inspection Report and Completion Statement**, pursuant to 310 CMR 40.0878 and 40.0879 (complete Sections A, B, C, E, G, H, I and J).

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You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

C. RESPONSE ACTIONS:

☐ Check here if any response action(s) that serves as the basis for the Phase submittal(s) involves the use of Innovative Technologies. (DEP is interested in using this information to create an Innovative Technologies Clearinghouse.)

Describe Technologies:

D. PHASE II COMPLETION STATEMENT:

Specify the outcome of the Phase II Comprehensive Site Assessment:

☐ Additional Comprehensive Response Actions are necessary at this Site, based on the results of the Phase II Comprehensive Site Assessment.

☐ The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class B Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ Rescoring of this Site using the Numerical Ranking System is necessary, based on the results of the final Phase II Report.

E. PHASE IV COMPLETION STATEMENT:

Specify the outcome of Phase IV activities:

☐ Phase V operation, maintenance or monitoring of the Comprehensive Response Action is necessary to achieve a Response Action Outcome. (This site will be subject to a Phase V Operation, Maintenance and Monitoring Annual Compliance Fee.)

☐ The requirements of a Class A Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

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E. PHASE IV COMPLETION STATEMENT: (continued)

☐ The requirements of a Class C Response Action Outcome have been met. Further operation, maintenance or monitoring of the remedial action is necessary to ensure that conditions are maintained and that further progress is made toward a Permanent Solution. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

Indicate whether the operation and maintenance will be Active or Passive. (Active Operation and Maintenance is defined at 310 CMR 40.0006.):

⊙ Active Operation and Maintenance ○ Passive Operation and Maintenance

(Active Operation and Maintenance makes the Site subject to a Post-RAO Class C Active Operation and Maintenance Annual Compliance Fee.)

F. PHASE V COMPLETION STATEMENT:

Specify the outcome of Phase V activities:

☐ The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

☐ The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

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LSP Name: Neal M. Drawas LSP #: 9844 Stamp:

Telephone: 508-443-1833 Ext.:

FAX: (optional) 508-443-1929

Signature:

Date: March 7, 1997

Massachusetts Department of Environmental Protection **BWSC-108**
Bureau of Waste Site Cleanup

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Name of Contact: Leonard Jolles Title: Property Mgr.

Street: 1 Main Street

City/Town: Whitinsville (Northbridge) State: MA ZIP Code: 01588

Telephone: 508-234-6301 Ext.: _____ FAX: (optional) _____

☐ Check here if there has been a change in the person undertaking the Response Action.

I. RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE ACTION(S): (check one)

☒ RP or PRP Specify: ⊗ Owner ○ Operator ○ Generator ○ Transporter Other RP or PRP: _____

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

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I, Leonard Jolles, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: _____ Title: Property Mgr.
(signature)

For: Arcade Realty Trust Date: _____
(print name of person or entity recorded in Section H)

Enter address of the person providing certification, if different from address recorded in Section H:

Street: same

City/Town: _____ State: _____ ZIP Code: _____

Telephone: _____ Ext.: _____ FAX: (optional) _____

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TABLE OF CONTENTS
PHASE I REPORT

ATF DAVIDSON
1 MAIN STREET
WHITINSVILLE, MA

RTN 2-0111

I. INTRODUCTION AND PURPOSE

This Phase I Initial Site Investigation Report has been prepared by Kroll Associates, Inc. (Kroll) on behalf of Arcade Realty Trust, the Owner and Potentially Responsible Party (PRP) of the Site identified as ATF Davidson, 1 Main Street, Northbridge, MA (the "Site"), also known as the "Arcade". The Site has been further identified by the Release Tracking Number (RTN) 3-1431 which was assigned by the Massachusetts Department of Environmental Protection, Central Regional Office (MA DEP CERO).

The Massachusetts Contingency Plan (MCP) 310 CMR 40.0000 has established various action levels, time sensitive reporting formats and an attendant fee structure to ensure adequate compliance with the intent of the regulation. Specific to this site is the requirement that it be Tier Classified [310 CMR 40.0501] if additional remedial measures are required at the site. Additionally, the MCP mandates that a Phase I Initial Site Investigation Report accompany any Tier Submittal [310 CMR 40.0481(2)] and that the report follow a prescribed format [310 CMR 40.0483].

This Phase I Report is based on information collected from the following sources:

- Facility inspections and assessment activities in order to categorize present day conditions at the site;
- MA DEP GIS Priority Resources Map, with databases listed at Figure 3:
- Review of available historical information regarding site use and progressive development, including available historical site plans and environmental reports.
- Review of federal, state and local regulatory information regarding the subject property and adjacent sites.
- Review of Whitinsville Water Company files:
- Interviews of knowledgeable individuals regarding site and facility history, and facility work practices.
- An on-site environmental inspection of the subject property conducted on February 10, 1997, including building interiors and a visual survey of the adjacent and surrounding properties.
- Caswell, Eichler & Hill,Inc., October 1985, "Monitoring Well Installation and Ground Water and River Bottom Sediment".
- Caswell, Eichler & Hill, Inc., January 1986, "Additional Investigations-ATF/Davidson Arcade Facility, Covitch Properties, Mumford River".
- Caswell, Eichler & Hill, Inc., October 1986, "ATF/Davidson Arcade Facility Sampling Report".

- Caswell, Eichler & Hill, Inc., March 1987, "Additional M-8 Investigations ATF/Davidson Arcade Facility, Whitinsville, Massachusetts".

- Kroll Associates, Inc., October 1996 and January 1997, "Groundwater Monitoring Data".

The earlier site assessments conducted by Caswell, Eichler & Hill, on behalf of the previous Owners, are included in the Appendices and are incorporated by reference in this Phase I Report.

2. SITE DESCRIPTION

The legal description of the subject property and street address is as follows:

Address: 355 Main Street
Northbridge (Whitinsville), Massachusetts

U.S. Geological Survey: Uxbridge Quadrangle
$42^0$06'41" North latitude
$71^0$40'46" West longitude

Universal Transverse
Mercator (UTM) Coordinates: 4,665,418mN; 278,463mE

MADEP Site Reference: 2-0111

The subject property is in a commercial/industrial zone and is currently used as warehouse, distribution and light manufacturing facility with two (2) tenants. The area around the subject property is a mixture of commercial and residential properties along Main Street, and is primarily residential properties west and north of the site. The Site is bounded on the south by the Mumford River.

Approximately 97,000 square feet are leased to Auburn Merchandise Distributors, Inc. (AMD) who employs approximately 150 employees. AMD operates a warehousing/distribution center for cigarettes and food supplies. The second tenant is MHPG, Inc. (MHPG) who performs silk screening of clothing and operates a warehouse and distribution center. MHPG currently employs approximately 135 employees.

The building is concrete, brick and partial steel siding, and occupies approximately 194,000 square feet of the 27 acre parcel, paved parking areas occupy the northern and western sides of the building. The building is primarily a single story structure, with a partial second story which contains a small locker room and an electric utility room. A boiler room with two (2) gas fired boilers provides steam heat throughout the entire building.

Two (2) separate metal utility type buildings are located southeast of the main building. One structure (approximately 15' by 25') is used by AMD for the storage of warehouse conveyance machinery. The second building (approximately 10' by 10' feet) houses an external electric transformer within a concrete containment basin.

SUBJECT PROPERTY LOCATION PLAN

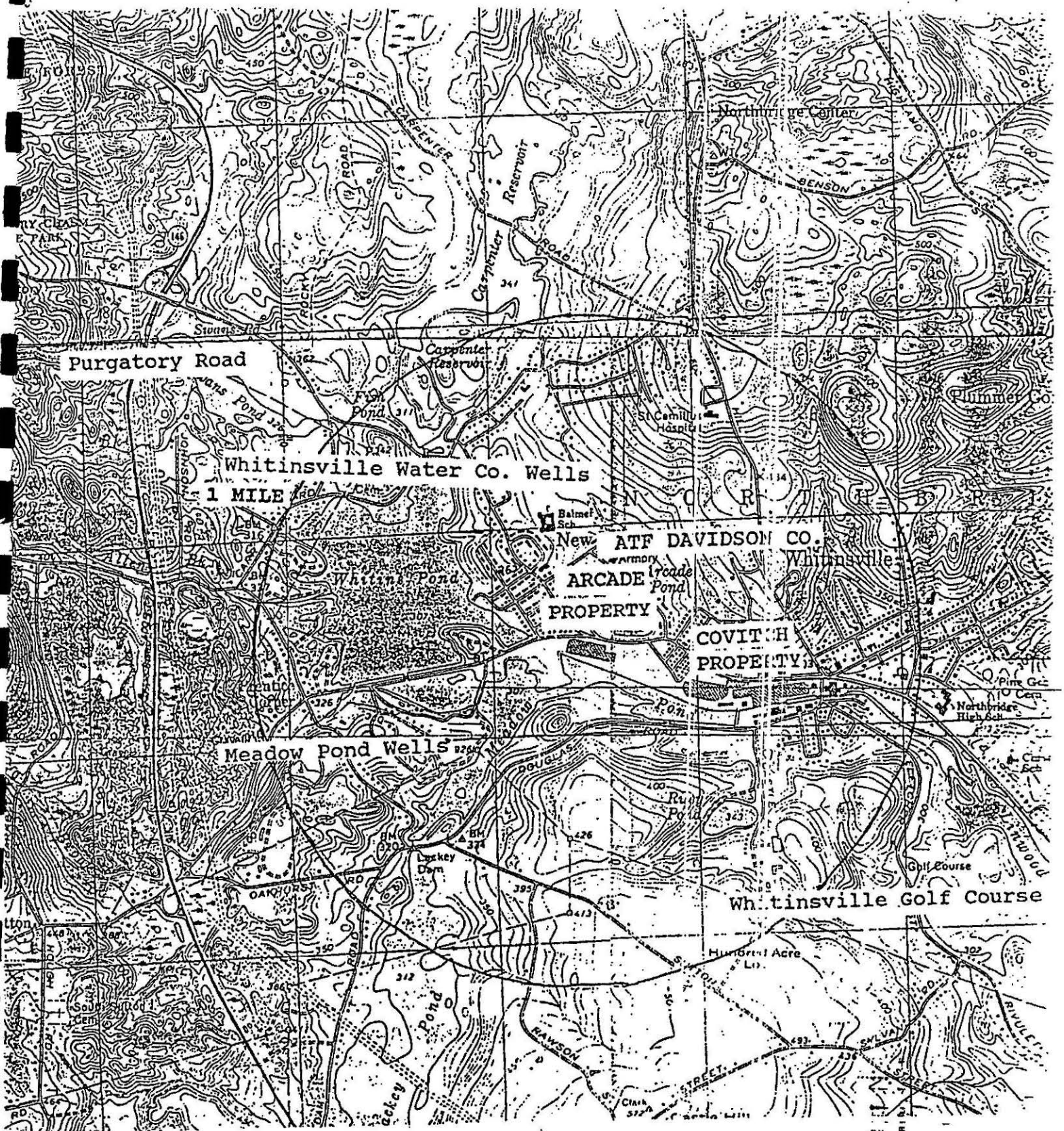


Figure 1. Locus Map of the ATF Davidson Co., Inc. Facility in Northbridge, MA.

3. SITE HISTORY

The ATF-Davidson property was a 73 acre facility directly west of the downtown portion of Whitinsville, a village within the Town of Northbridge (see Figure 1). The site is located in the 50-100 year flood plain. The Site was later sub-divided into the Covich property (46 acres) and the ATF-Davidson "Arcade" (27 acres) by ATF-Davidson and sold the east portion to Covich.

The entire property was originally owned by the Whitin Machine Works which produced textile machines at the Covich location from approximately 1837 to 1979. From 1941-1945, 85% of the facility was converted to war production. After the war, production of textile machines resumed. In 1966, the company converted to the production of graphic arts equipment. Whitin Machine, then part of ATF-Davidson, ceased operations in 1982.

Subsequent to the Whitin Machine Works, ATF-Davidson utilized the Arcade property to produce printing machines. Historic processes included turning, milling, grinding, metal treatment, assembly, painting and testing.

Foundry wastes from the foundry at Whitin Machine Works were mixed with spent foundry sand and were deposited, from roughly 1930 to 1979, adjacent to the present day Covich property in an unlined landfill called the "Arcade". The landfill area initially consisted of overburden of river sediments over bedrock extending approximately 3200 feet along the northern bank of the Mumford River. The Arcade facility was built upon a portion of the filled area. Total volume of the landfill was estimated at 40,000 cubic yard; total surface area is estimated at 730,000 square feet. Foundry sands range in size from fine to coarse with some pumice like material, foundry glass and ash.

Monitoring wells which were initially installed in 1985 detected groundwater within the "Arcade" site was found to be contaminated with volatile organic constituents (VOCs) and heavy metals. This resulted in the Arcade site being listed as a "Confirmed Non-Priority Site" by the MA DEP on October 15, 1987. Volatile organic constituents appear to be concentrated within one general area on the Arcade property suggesting that limited and random spillage may have occurred. Heavy metal constituents appeared to be located in two (2) discrete locations along the Site's southern boundary. Monitoring wells on the Covich Property have never indicated the presence of contaminants in groundwater at or near action levels.

The parcels which make up the subject site are currently owned by Arcade Realty Trust.

THIS PHASE I REPORT SPECIFICALLY ADDRESSES ONLY THE ATF-DAVIDSON "ARCADE" PROPERTY.

4. SITE HYDROGEOLOGICAL CHARACTERISTICS

Based on the surface topography of the area and the proximity of the Mumford River south of the subject property, it appears that both surface and groundwater regional flow is to the south/southeast.

Surface water runoff is discharged to storm drains located on the property which discharge directly into the Mumford River. A survey of monitoring well elevations and gauging of monitoring wells on the subject property confirm local groundwater conditions. Environmental reports by Caswell, Eichler & Hill, Inc. (1985, 1986 and 1987) and Kroll (1996 and 1997) indicate the presence of fill to a depth of 7.0 to 14.5 feet below grade (fbg) and river bottom sediments extending an additional three feet to refusal. Groundwater fluctuates at depths between approximately 3 to 5.5 feet and generally flows south beneath the site and discharges into the Mumford River.

5. NATURE AND EXTENT OF CONTAMINATION

There have been a number of environmental studies and groundwater monitoring events of the subject site which are listed below.

Caswell, Eichler & Hill,Inc.	October 1985
Caswell, Eichler & Hill, Inc.	January 1986
Caswell, Eichler & Hill, Inc.	October 1986
Caswell, Eichler & Hill, Inc.	March 1987
Caswell, Eichler & Hill, Inc.	July 1987
Kroll Associates, Inc.	October 1996
Kroll Associates, Inc.	January 1997

In 1985, eight shallow monitoring wells (M-1 through M-8) were installed by ATF-Davidson (see Figure 2). Groundwater samples were collected and analyzed for VOCs, metals and inorganics and cyanide. Groundwater samples from monitoring well M-3 (west of the building) were also analyzed for oil and grease, Soil samples were collected from each monitoring well from the surface and every 5 feet in depth.

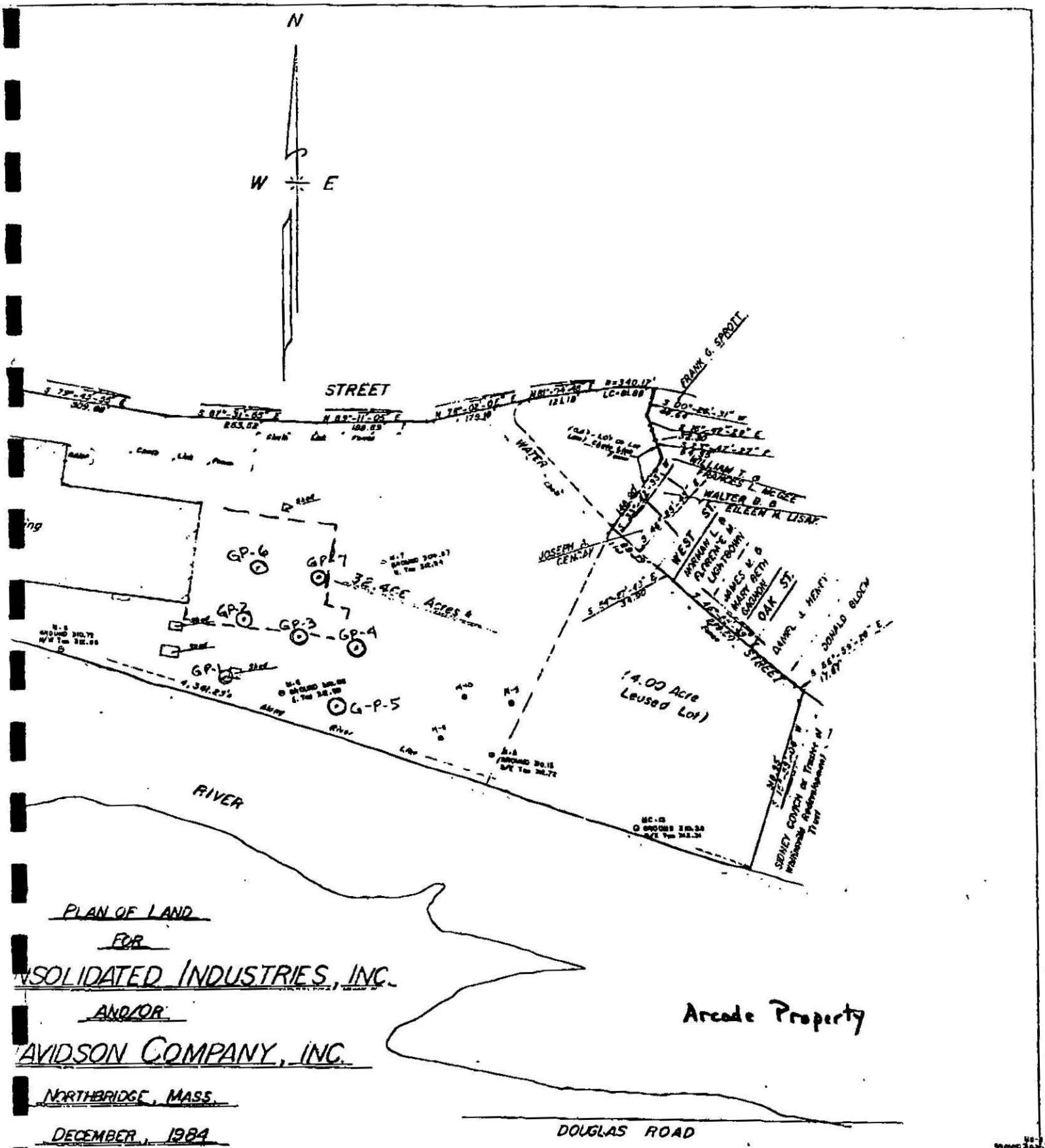
Analysis of groundwater samples indicated that VOC contamination was present only in monitoring wells M-3, M-6 and M-8. Analysis of samples from the other wells did not reveal VOC constituents. Analysis of groundwater samples for priority pollutant metals, barium and cyanide revealed levels well below the Massachusetts Drinking Water Standards for all metals except barium. Barium was identified at concentrations near or slightly above that standard in monitoring wells M-4, M-5, M-6 and M-8. Oil and grease in monitoring well M-3 was less than 500 ppb.

Five benthic cores (B-1 through B-5) were taken from the littoral zone of the Mumford River bottom. The five benthic samples taken from the river bottom in 1985 were characterized as dark organic peat and muck. None of the 14 metals analyzed had levels above the maximum allowable concentrations of contaminants per the MCP Method 1 Standards. In addition, Caswell, Eichler and Hill conducted Extraction Toxicity testing on the sediments. Only chromium appeared to of significant concentration warranting further discussion by Caswell, Eichler and Hill. In this case, chromium was found up to 410 ug/g in the benthic samples and the level at which chromium is potentially EP Toxic in sediment samples is 100 ug/l. The upgradient to downgradient (in terms of river flow) concentrations of chromium in the benthic samples were as follows:

B-5	64 ug/g
B-1	410 ug/g
B-2	250 ug/g
B-3	400 ug/g
B-4	100 ug/g

As reported, the upgradient concentration is itself moderately high, although not potentially EP Toxic. Caswell, Eichler and Hill reported that the remaining four downgradient samples all, exceeded their criteria for delineating potential EP Toxicity but are less than the 1,000 ug/g Method

MONITORING WELL LOCATION PLAN



PLAN OF LAND

FOR

NSOLIDATED INDUSTRIES, INC.

AND/OR

AVIDSON COMPANY, INC.

NORTHBRIDGE, MASS.

DECEMBER, 1984

METERS 10 20

FEET 30 40 50

ION 1 FOOT = 0.3048 METERS

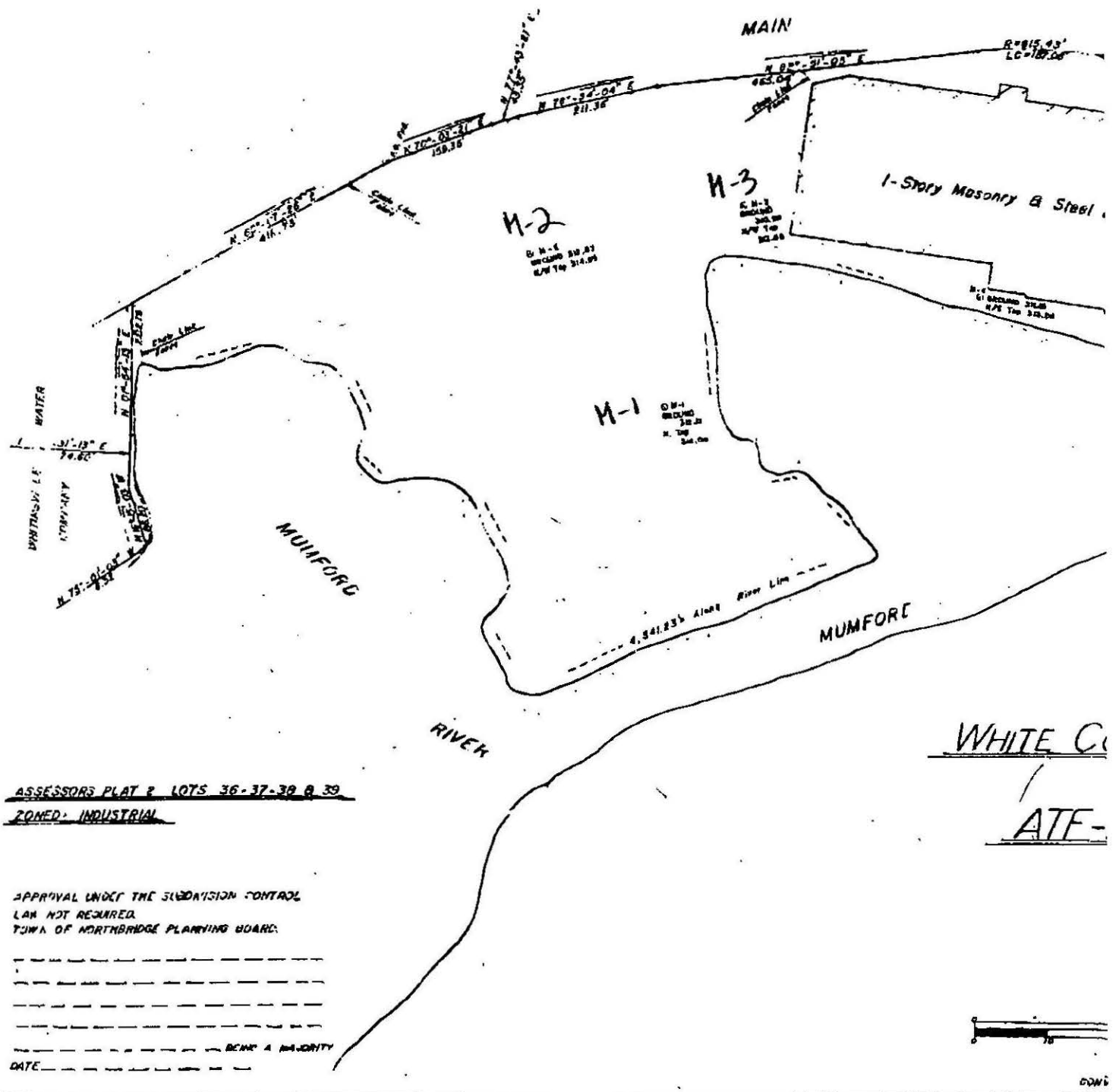
BBEAULT AND FLORENTZ ENGINEERING CO.

CIVIL ENGINEERS AND LAND SURVEYORS

99 MAIN STREET, WOONSOCKET, R.I.

FOR REGISTRY USE ONLY

I CERTIFY THAT I HAVE CONFORMED WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS IN PREPARING THIS PLAN.



WHITE C

ATF-

ASSESSORS PLAT 2 LOTS 36-37-38 & 39

ZONED: INDUSTRIAL

APPROVAL UNDER THE SUBDIVISION CONTROL LAW NOT REQUIRED.
TOWN OF NORTHBRIDGE PLANNING BOARD:

_____

_____

_____

_____

_____ BEING A MAJORITY

DATE_____

1 Standard. These elevated chromium concentrations nay have come from two potential sources, the ATF-Davidson site or some upgradient facility. ATF-Davidson and White Consolidated Inc. officials have stated that they have never used chromium at the Arcade facility, and chromium is not a constituent of concern based on on-site sampling and analysis. Therefore the reasonable conclusion is that the source of this constituents was an upgradient/upstream source.

Caswell, Eichler and Hill explained that the increase in concentrations between B-5 and the remaining samples pertains to changes in the morphology of the river from the Whitinsville Water Company parcel, past the Arcade facility to the dam on the Covich property. The dam creates a large head pond (Whitin Pond) that extends back up the river past the ATF-Davidson facility. As chromium laden organic material flowed past the channelized portion of the river opposite the Whitinsville Water Company, it remained in suspension due to adequate flow velocity. As this material entered the head pond, decreased flow velocity would tend to facilitate settling. As the organic matter degraded, the concentration of incorporated metals such as chromium increased in the sediments. Both textile and tannery facilities (which normally use chromium in their processes) were in operation further up-river, this settling and accretion theory seems to be the most plausible explanation for the levels of metal constituents noted the benthic samples, as chromium is not a constituent of concern for the Arcade site.

In December 1985, additional groundwater samples were obtained from monitoring wells M-1 through M-8. As with the July 1985 analyses, samples from monitoring wells M-1, 2, 4 and 5 did not reveal detectable levels of VOC constituents. Vinyl chloride and 1,2-dichloroethylene were detected in monitoring wells M-3, 6 and 8. Trichloroethylene and tetrachloroethylene were only detected in monitoring wells M-6; and 1,1-dichloroethylene was detected in monitoring well M-7. Levels of barium were near or above the Massachusetts Drinking Water Standard in monitoring wells M-4, 5, 6, and 8.

From February 1986 through August 1986, three additional rounds of analysis were performed on all wells. Groundwater samples analyzed from monitoring wells M-1, 2 and 5 did not contain VOC constituents. Elevated concentrations of 1,2-dichloroethylene and vinyl chloride were found in monitoring wells M-6 and 8. In January 1987, three additional monitoring wells (M-9, 10 and 11) were installed in a radial fashion in an area hydraulically upgradient from monitoring well M-8. Each well was approximately 100 feet from monitoring well M-8 and its adjacent counterpart. Analysis of samples indicated that the contaminants found in monitoring well M-8 were observed in low or non-detectable levels in monitoring wells M-9, 10 and 11 in groundwater samples, Soil boring samples were devoid of the same contaminants found in the groundwater samples, which suggests a limited and localized presence from a historical release. Caswell, Eichler and Hill concluded that groundwater and the contaminants were obviously flowing toward and being diluted by the Mumford River, thus no health or environmental hazard existed.

In 1987, Caswell, Eichler and Hill (CEH) prepared a Risk Assessment which focused on the contaminated area surrounding monitoring well M-8 at the subject property. The Risk Assessment was comprised of a Hazard Assessment, Exposure Assessment and a Risk Assessment. Investigation centered about the average levels of three VOCs that had been present in the groundwater samples from monitoring well M-8. CEH investigated possible routes of exposure from air and surface water. Potential receptors included local residents and employees of local businesses. CEH concluded that the concentrations of the contaminants as calculated were very low in both pathways and that the risks associated with exposure were calculated to be negligible. MADEP had reviewed the CEH Risk Assessment and concluded that although CEH used an average level of the three VOCs present in the groundwater instead of the highest levels, according to MADEP engineers they doubted whether using the highest concentrations would significantly change the results.

In October 1996 and January 1997 (see Table 5.1), Kroll Associates performed another sampling round of the Arcade monitoring wells and installed seven Geoprobe borings to collect soil and groundwater samples in the vicinity of new building construction. With exception of vinyl chloride in monitoring wells M-6 and M-8 and boring GP-6, all VOC constituent concentrations had notably reduced concentrations and were less than Massachusetts Contingency Plan action levels. The sole presence of vinyl chloride, the final daughter constituent associated with natural degradation, confirms CEH's Risk Assessment conclusions that historic releases of volatile organic materials were limited in magnitude and should naturally degrade over time without the need for additional treatment. Barium concentrations previously found in monitoring wells above MCP action levels, were now found at levels less than MCP standards.

6. MIGRATION PATHWAYS AND EXPOSURE POTENTIAL

As shown in Figure 3, the only environmentally sensitive receptor within 500 feet is the Mumford River bordering the site along the southern boundary. Within a 1/2 mile radius north and west of the Site is a portion of the Whitinsville Water Company well field and its surrounding productive aquifer. However, the groundwater flows in a south/southeasterly direction into the Mumford River downgradient of the Whitinsville Water Company well field. The MADEP GIS Priority Resource Map (see Figure 3) incorrectly identifies that the subject site lies within the Interim Protection Wellhead Zone of the Whitinsville Water Company Whitin Pond well field. Engineering documentation (see Figure 4) prepared by the water company's consultant (Whitman & Howard) specifies a Defined Zone II Protective area (see Figure 4) which is upgradient and off-site from the subject Site.

The only identified migration pathway for the vinyl chloride release at this Site appears to be through subsurface migration to the river. River sampling conducted by Caswell, Eichler and Hill did not detect vinyl chloride or other volatile organic constituents, indicating that any volatile organics reaching the river are rapidly attenuated through evaporation, dilution and degradation.

Other potential receptors include workers and visitors to the Site. Under current conditions, exposure to vapors or fugitive dust appears minimal due to the depth of the observed contamination (over 3 to 5 feet below grade). However, under future conditions construction or utility worker in excavated trenches within the area of groundwater contamination could be exposed, and proper precautions should be taken. Any future building construction should be designed to incorporate a vapor control barrier with passive subsurface ventilation to prevent vapors rising into the building(s).

A number of other potential contaminants were identified in the earlier studies prepared by Caswell, Eichler and Hill (see Appendices). However, there is no evidence to indicate that there are any other constituents which exceed MCP Method 1 Cleanup Standards other than those previously discussed.

MADEP GIS NATURAL RESOURCE MAP

MA DEP - Bureau of Waste Site Cleanup

Site Scoring Map: 500 feet & 0.5 Mile Radii

SITE NAME:

ATF DAVIDSON PROPERTY
1 MAIN STREET
NORTHBRIDGE, MA
4665418n 278463ew

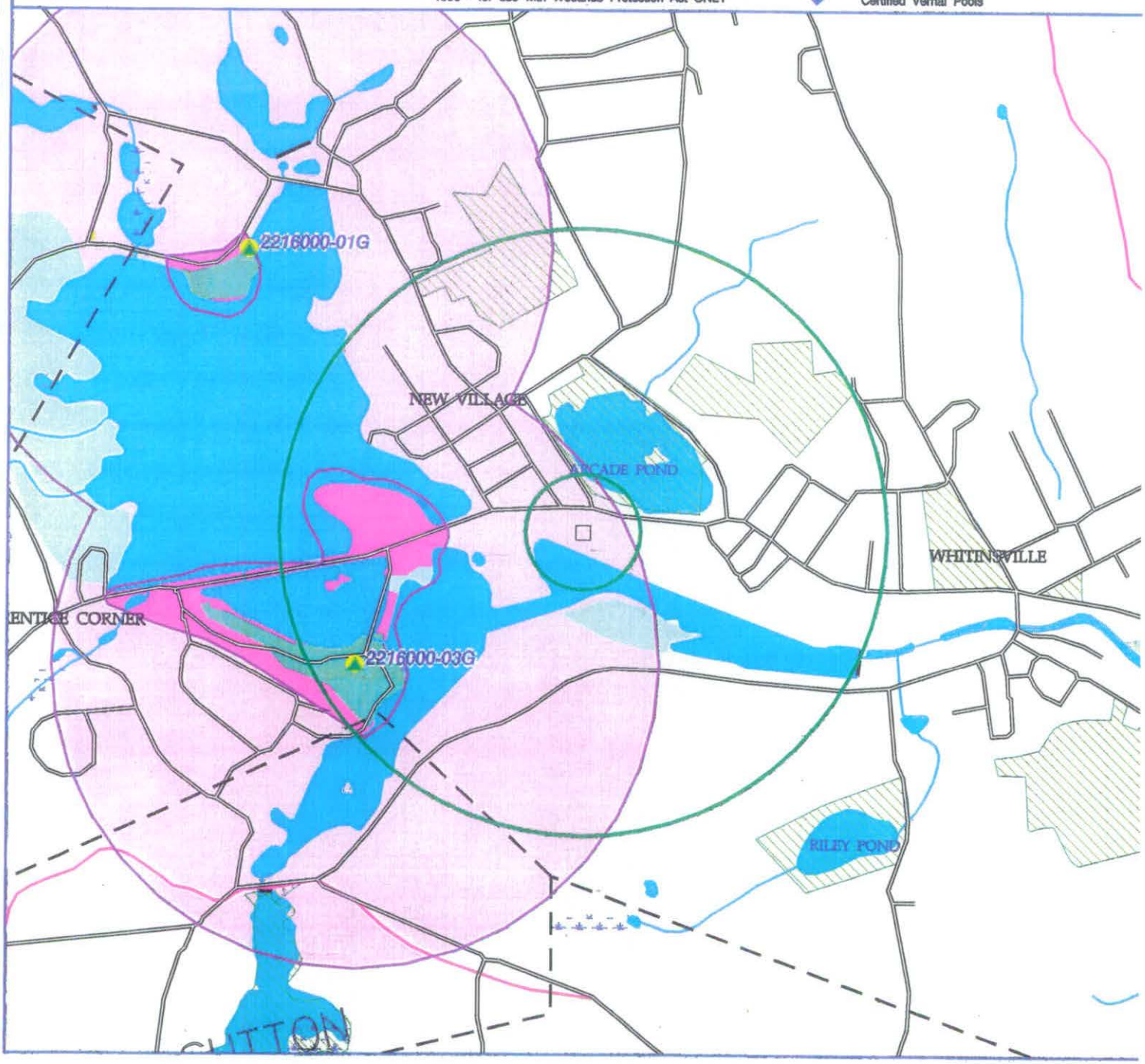
September 13, 1996

SCALE 1:15000

The information shown on this map is the best available at the date of printing. Please refer to the data source descriptions document.

- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer
- NOT Potentially Productive Medium Yield Aquifer
- NOT Potentially Productive High Yield Aquifer
- EPA Designated Sole Source Aquifers
- DEP Approved Wellhead Protection Area - ZONE 2
- Interim Wellhead Protection Area
- Public Surface Water Supply
- Lakes, Ponds, Other Fresh Water Features
- Bays, Estuaries, Other Salt Water Features
- Fresh Water Non-Forested Wetlands
- Salt Water Wetlands
- State, Federal, Municipal, Nonprofit and Private Open Space and Recreational Facilities
- Areas of Critical Environmental Concern
- DEP Permitted Solid Waste Facilities
- NHESP Estimated Habitats of Rare Wetlands Wildlife 1995 - for use with Wetlands Protection Act ONLY

- State, U.S., Interstate Routemarkers
- Interstate Highway
- U.S. Highway
- State Highway
- Other Roads
- Municipal Boundary
- County Boundary
- Train
- Powerline
- Pipeline
- Aqueduct
- Major Drainage Basin
- Sub Drainage Basin
- Zone of Contribution
- Public Water Supply - Groundwater
- Public Water Supply - Surface Water
- Non Community Public Water Supply
- Certified Vernal Pools



NRS SCORING MAP DATA SOURCES

AQUIFERS: USGS-WRD/MassGIS, 1:48,000. Automated by MassGIS from the USGS Water Resources Div. Hydrologic Atlas series manuscripts. The definitions of high and medium yield vary among basins. (1977 to 1988.)

SOLE SOURCE AQUIFERS: US EPA/MA DEP/MassGIS, various scales. They are defined by EPA as aquifers that are the 'sole or principal source' of drinking water for a given aquifer service area. Last updated July 1993.

DEP APPROVED ZONE IIS: MA DEP, 1:25,000. As stated in 310 CMR 22.02 'that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated.' Digitized from the DEP Water Supply Protection Atlas by DEP-DWS (Division of Water Supply) staff. (1983 to January 1995.)

POTENTIALLY PRODUCTIVE AQUIFERS: DEP-BWSC (Bureau of Waste Site Cleanup. These aquifers are defined as all medium or high yield aquifers except for that portion of the aquifers surface area that falls within a city or town that has a population density of greater than 4400 people per square mile, based on the most recent US. Census.

INTERIM WELLHEAD PROTECTION AREAS: DEP-DWS (Division of Water Supply), 1:25,000. Half-mile buffers zones were generated using the Community Public Water Supplies point coverage (see below). These polygons represent an interim Zone II for a groundwater source until an actual one is approved by the DEP Division of Water Supply. (January 1995.)

HYDROGRAPHY: USGS/MassGIS. Nearly half of the state is available as 1:24000/1:25000 USGS Digital Line Graph (DLG) data. In addition, for 40% of the state, USGS 1:100000 DLG hydrography has been enhanced with 1:25000 hydrographic features. The remainder were digitized at 1:25000 by MassGIS. Source dates vary for DLG's and USGS quadrangles.

WETLANDS: UMass Amherst RMP/MassGIS, 1:25,000. Includes nonforested wetlands extracted from the 1971-1984 Land Use datalayer which was photointerpreted from Summer CIR photography. Interpretation was not done in stereo. Also includes, in some areas, forested wetlands from USGS Digital Line Graph (DLG) data.

PROTECTED & RECREATIONAL OPEN SPACE: EOEA (Executive Office of Environmental Affairs) MassGIS, 1:25,000. Includes federal, state, county, municipal, non profit, private conservation and recreation lands and facilities. Geographic data sources are predominately town tax assessor maps and existing open space plans. Most of these maps have been recompiled onto a 1:25000 basemap provided by MASSGIS. The data are then digitized from these basemaps, which contain registration points. Ongoing updates.

ACECs: CZM and DEM, 1:25,000. Areas of Critical Environmental Concern are areas designated by the Secretary of EOEA as having a number of valuable environmental features coexisting. Projects in ACECs are subject to the highest standards of review and performance. Last updated October 1992.

ROADS: USGS/MassGIS, 1:100,000. MassGIS extracted roads from the USGS Transportation DLG files. They generalized, modified, and updated this coverage. Major roads are part of the state, US. or interstate highway systems. Circa 1985.

DRAINAGE BASINS: USGS-WRD/MassGIS, 1:24,000. Automated by MassGIS from USGS Water Resources Division manuscripts with approximately 2400 sub-basins as interpreted from 1:24,000 USGS quadrangle contour lines. Individual basins for surface Community Public Water Supplies were added by DEP in April 1993. 1987 - 1993.

POLITICAL BOUNDARIES: MassGIS/USGS, 1:25,000. This datalayer was digitized by MassGIS from mylar USGS quads. Source date is approximately 1985.

QUADRANGLE INDEX: MassGIS. Generated from USGS 7.5 minute quadrangle corner coordinates converted from lat/long to Mass. State Plane coordinates. 1985.

DEP PERMITTED SOLID WASTE FACILITIES: DEP-DSW (Division of Solid Waste), 1:25,000. Includes only facilities regulated since 1971. Most are sanitary landfills, though transfer stations and recycling or composting facilities are included. Either facility boundaries were compiled or approximate facility point locations drafted onto USGS quadrangles and automated by the DEP Division of Solid Waste. Last updated 1994.

PUBLIC WATER SUPPLIES: DEP-DWS, 1:25,000. Community and non-community surface and groundwater withdrawal points were field collected using Global Positioning System receivers. The attributes were added from the DEP Division of Water Supply database. Last updated January 1995.

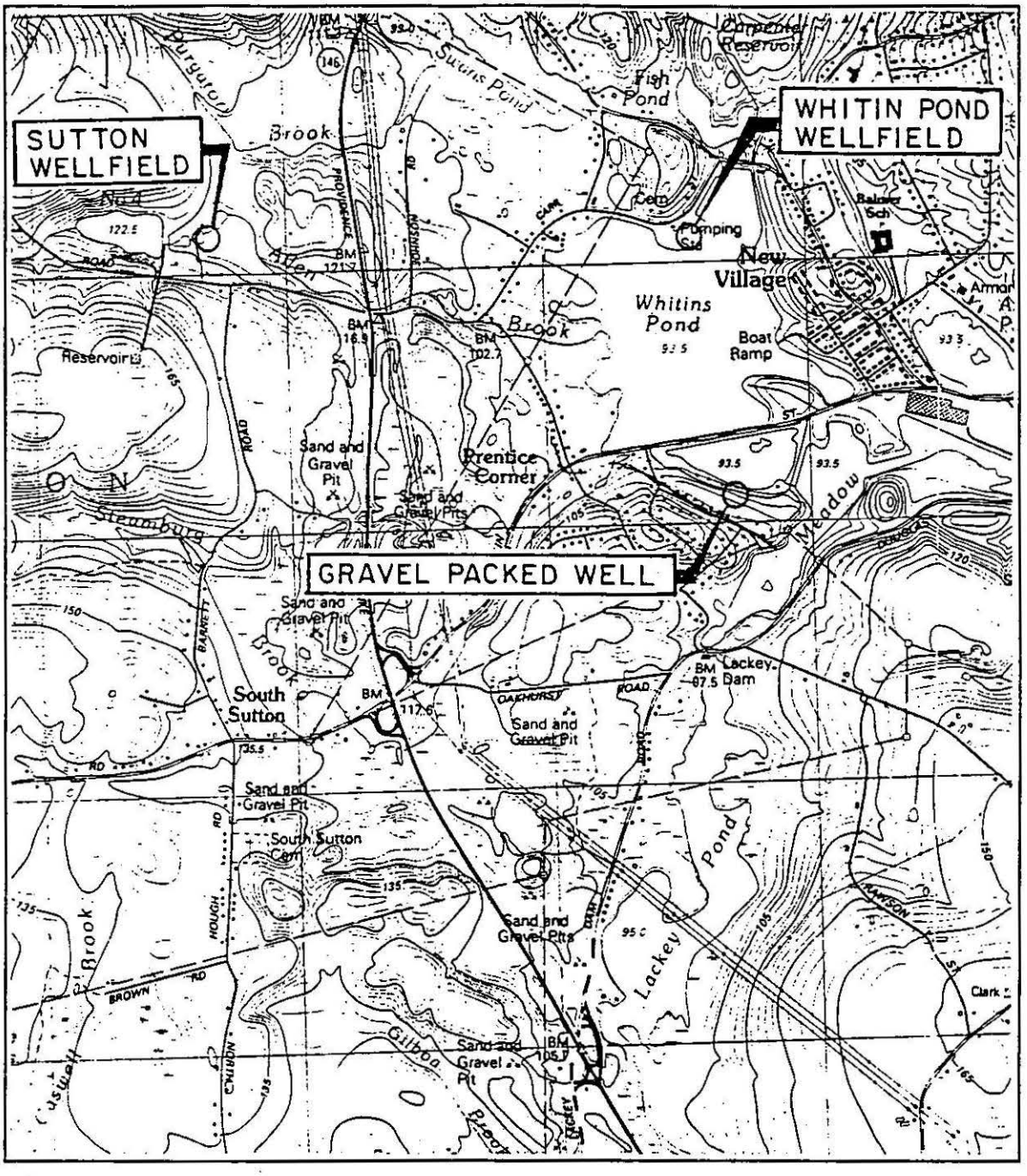
SITE LOCATION: Location coordinates were converted to state plane coordinates from user supplied longitude and latitude or UTM. Coordinates are site specific and source dates vary.

NHESP Estimated Habitats of Rare Wetlands Wildlife: Polygons show estimated habitats for all processed occurrences of rare wetlands wildlife. Data collected by Natural Heritage & Endangered Species Program and compiled at 1:24000 or 1:25000 scale. For use with Wetlands Protection Act Only. Effective Jan. 1, 1995 through Dec. 31 1995.

NHESP Certified Vernal Pools: Points show all vernal pools certified by NHESP/MADFW (Fisheries and Wildlife) as of January 1, 1993. Data compiled at 1:24000 or 1:25000 scale. Effective January 1, 1995 through December 31, 1995

Last Revised FEBRUARY 6, 1995

WHITINSVILLE WATER COMPANY
ZONE II DELINEATION MAPS



North

Scale 1:25 000

LOCUS MAP

ZONE II DELINEATIONS
WHITINSVILLE WATER COMPANY
WHITINSVILLE, MASSACHUSETTS

FIGURE 1-1

SOURCE: USGS UXBRIDGE QUADRANGLE

W&H

ZONE II DELINEATION

) AND

WHITINSVILLE WATER COMPANY
WHITINSVILLE, MASSACHUSETTS

7. SUMMARY AND CONCLUSIONS

Historic site assessment studies suggest that limited and random disposal of hazardous constituents occurred on the property during prior ownership. As previously noted subsurface investigations and on-going groundwater monitoring have identified the presence of heavy metal and volatile organic constituents. Initial assessments (1985-1987) reported that groundwater Reportable Concentrations were exceeded for barium, vinyl chloride, 1,1,1 trichloroethylene, 1,2 dichloroethylene and tetrachloroethylene. Recent groundwater sampling and analyses have demonstrated a notable reduction of barium and all volatile organic constituents with the exception of vinyl chloride. These results support the opinion that the historic releases were limited in volume and distribution, and that natural attenuation and degradation have reduced the VOC and toxic metal constituents to levels below MCP action levels, with exception of vinyl chloride.

In response to MADEP's January 8, 1997 request, this Phase I Initial Site Investigation Report must be completed and filed with the MADEP along with a Tier Classification Submittal prepared by an Licensed Site Professional in accordance with the MCP. Based on historical and recent groundwater data, the recommended course of action is to conduct annual monitoring of the groundwater condition for the next two to three years. It is anticipated that through natural degradation and attenuation groundwater will attain MCP standards.

Within three years the groundwater condition should be re-evaluated, and either a Remediation Action Outcome (RAO) Statement filed or, if residual constituents remain consistent, a Phase II Assessment and Phase III Remediation Plan will have to be prepared and submitted to the MA DEP to ensure a level of No Significant Risk to health, safety, public welfare and the environment.

MONITORING WELL INSTALLATION

AND

GROUND WATER AND RIVER BOTTOM SEDIMENT

QUALITY ANALYSES

AFT/DAVIDSON COMPANY

ARCADE FACILITY

WHITTINSVILLE, MASSACHUSETTS

CASWELL, EICHLER & HILL, INC.

PORTSMOUTH, NEW HAMPSHIRE

OCTOBER 1985

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INTRODUCTION

The Massachusetts Department of Environmental Quality Engineering (DEQE) requested that a hydrogeologic site assessment be conducted at the ATF/ Davidson Company (ATF/D) Arcade facility in Whitinsville, Massachusetts. In that ATF/D is a subsidiary of White Consolidated Industries (WCI) of Cleveland, Ohio, WCI and ATF/D retained Caswell, Eichler and Hill, Inc. (CEH) to develop and implement a plan that would satisfy DEQE requirements concerning the general hydrogeologic site assessment. This assessment would include the installation of monitoring wells, the collection of soil, river bottom and grounwater samples, the measurement of groundwater elevations, the completion of a vertical and horizontal survey of the monitoring well locations, and completion of selected laboratory analyses for volatile organics (EPA 624), oil and grease, barium, total cyanide and priority pollutant metals.

CEH, a professional firm of geologists, hydrologists and geophysicists, assumed the project's lead role. Environmental Field Services (EFS) and Resource Analysts, Inc. (RAI) of Hampton, New Hampshire performed the ground water sampling and laboratory analyses. New England Boring Contractors, Inc. of Glastonbury, Connecticut performed the drilling, soil sampling and monitoring well construction. Bibeault and Florentz, Inc. of Woonsocket, Rhode Island performed the elevational and location survey to establish horizontal and vertical control on the monitoring wells.

WORK PERFORMED

A. DRILLING AND MONITORING WELL CONSTRUCTION. As whown on the FACILITY MAP AND SHALLOW HORIZONTAL FLOWNET (Figure 1), eight locations (M-1 through M-8) were chosen for the installation of shallow monitoring wells. Where possible, hollow stem augers (3 inch I.D.) were advanced to below the water table, and standard split-spoon sampling was completed to note stratigraphy. Threaded, flush joint, ten-slot PVC screen (1.5 inch I.D.) was set at and below the water table, and solid PVC riser of the same design and dimension was installed to roughly two feet above land surface. Ottawa sand was packed around the screen, and a two foot thick bentonite seal was installed approximately one foot above the top of the screen. Additional sand was added to within two feet of land surface in each boring, and a locking steel protective pipe was cemented in place. All wells were fully developed upon completion, and all augers were thoroughly washed between borings.

B. GROUND WATER, SOIL AND RIVER BOTTOM SAMPLING AND LABORATORY ANALYSES. Each completed monitoring well was either pumped dry six times, or six times its volume was extracted prior to sampling. Standard EPA sampling and sample preservation and analysis techniques were employed by EFS and RAI. Ground water samples that were to be tested for volatile organic compounds were taken with a stainless steel bailer. Samples that were to be tested for metals and inorganics were taken with a peristaltic pump. Dedicated tubing was used in each well, and all samples for metals and inorganics were field filtered. Chain of Custody and Field Data forms were completed for each well and set of samples. Please note that the Temperature (°C) Readings reported on the field data forms correspond to the Conductivity (umhos) when it was read, not when the sample was first extracted from the well.

Each ground water sample was analysed for volatile organic compounds (EPA 624), barium, priority pollutant metals, and total cyanide. Samples from M-3 were also analysed for oil and grease.

During construction of the monitoring wells, standard soil sampling was conducted in each boring. An eighteen inch split-spoon sample was taken at the surface and every five feet thereafter. A final sample was taken, or attempted in the case of hollow stem auger refusal, at the bottom of each boring. The samples were placed in standard soil sample jars and kept for future inspeciton and possible laboratory analysis.

Five benthic cores (B-1 through B-5) were taken from the littoral (near-shore) zone of the Mumford River bottom using a canoe and hand corer. The cores were placed in a standard 1 liter glass sample jar and kept cool prior to delivery to the laboratory. Each sample was analysed for priority pollutant metals and barium.

C. SURVEY FOR HORIZONTAL AND VERTICAL CONTROL. Upon completion of the drilling and monitoring well construction, the locations of the borings and wells were surveyed for horizontal and vertical control. Vertical control was established using a U.S.G.S. benchmark in feet above mean sea level (FT-MSL). Each well top and the immediately adjacent ground surface were surveyed to the nearest hundreth of a foot. Where a well could not be installed, the ground surface at the location of the boring was surveyed. These data, coupled with the subsurface data gathered during the drilling and water level measurement tasks, allowed for the construction of all figures and tables presented herein.

HYDROGEOLOGIC SETTING

The AFT/D Arcade site lies along 3200 feet of the north bank of the Mumford River in Whitinsville, Massachusetts. It is bounded on the east by Sidney Covitch properties, north by Main Street, and west by the Whittinsville Water Company. The Mumford River, which forms the site's southern bondary, flows from west to east.

Nearly the entire site is comprised of foundry fill which is a fine to coarse sand and gravel with some pumice like material, foundry bed glass and ash. This foundry material was continually removed for years from the large foundry at the western end of the Covitch property, and graded out into the river. The resulting land mass presently supports a demolitions debris storage area which abuts the Covitch property, and the ATF/D Arcade facility. The western terminus of the fill consists of an island in the Mumford River, and the aforementioned Whitinsville Water Company parcel.

RESULTS AND CONCLUSIONS

A. SITE HYDROGEOLOGY. All of the monitoring wells encountered foundry fill throughout their entire depth except M-1. Because one boring was required to be drilled to refusal, M-1 encountered river bottom sediments (brown washed fine to coarse sand and gravel with occasional cobbles and small boulders) at approximately elevation 297. Hollow-stem auger and split-spoon refusal was encountered at elevation 294. This refusal elevation probably corresponds to the bedrock surface elevation as an outcrop is clearly visible about 200 feet to the southeast. This outcrop is at the shoreline of a naturally occuring (bedrock supported) island in the Mumford River comprising the study area's southwestern boundary. Foundry fill was advanced out into the river to the island, effectively incorporating it into the new land mass formed by the fill.

The locations where monitoring wells were completed are shown on Figure 1. Further, data from the drilling and water level measurement tasks were used to construct Monitoring Well and Subsurface Data (Table 1), and Cross Sections A-A', B-B' and C-C' (Figures 2, 3 and 4). Examination of these constructs can educate the reader as to the hydrogeologic nature of the site far better than reading numerous descriptive paragraphs. Some time digesting these compilations is, therefore, recommended prior to and while reading the remainder of the report.

Ground water generally flows south beneath the site, discharging to the river. The average velocity of groundwater flow can be computed, for example, by examining Figure 4. A flow line from M-7 to the river is approximately 450 feet in length. Given the grain size characteristics of the fill, we have estimated a hydraulic conductivity (K) of 1×10^{-3} cm/sec (3.28×10^{-5} ft/sec), and a corresponding effective porosity (n_e) of 0.20. Using these estimates and a calculated hydraulic gradient (i) of 4.44×10^{-3} (where, $\frac{306' - 304'}{450'}$) it is possible to estimate the seepage velocity ($\bar{v}$).

$$\bar{v} = \frac{Ki}{n_e} = \frac{(3.28 \times 10^{-5} \text{ ft/sec})(4.44 \times 10^{-3})}{0.20}$$

$$= 7.28 \times 10^{-7} \text{ ft/sec}$$

$$= 23 \text{ ft/yr}$$

B. GROUND WATER QUALITY. Appendix B contains the groundwater quality data for each well. Additionally, as seen on the field data form, conductivity, temperature (at the time of conductivity reading) and pH were also determined. As the results of the analyses show, no significantly elevated levels of priority pollutant metals were detected. Barium slightly exceeded the Safe Drinking Water Standards in M-5 and M-8. Several of the wells, however, exhibited volatile organic contamination. Samples from M-3 contained 210 ug/l vinyl chloride, 250 ug/l 1,2-trans-dichloroethylene and 10 ug/l trichloroethylene. Samples from M-6 contained 15 mg/l 1,2-trans-dichloroethylene, 30 ug/l trichloroethylene and 950 ug/l tetrachloroethylene. Samples from M-8 contained 260 ug/l vinyl chloride, a trace of 1,1 dichloroethane, 610 ug/l 1,2-trans-dichloroethylene, 30 ug/l trichloroethylene and a trace of tetrachloroethylene.

TABLE 1

MONITORING WELL AND SUBSURFACE ELEVATIONAL DATA
ARCADE SITE

WELL#	LAND SURFACE ELEVATION (FT-MSL)	TOP OF PIPE ELEVATION (FT-MSL)	LENGTH OF RISER (FT)	7-16-85 WATER TABLE ELEVATION (FT-MSL)	7-18-85 WATER TABLE ELEVATION (FT-MSL)	WATER TABLE ELEVATION NOTED DURING DRILLING (FT-MSL)	BOTTOM OF BORING ELEVATION (FT-MSL)	TOP OF SCREEN ELEVATION (FT-MSL)	BOTTOM OF SCREEN ELEVATION (FT-MSL)
M-1	312.12	314.04	1.92	305.73	305.73	303.32	293.82	303.12	298.12
M-2	312.87	314.99	2.12	306.21	306.24	305.57	300.87	305.87	300.87
M-3	310.99	312.65	1.66	305.90	305.75	305.99	299.49	305.99	300.99
M-4	311.19	313.24	2.05	305.60	305.56	305.69	299.69	306.19	301.19
M-5	310.72	312.85	2.13	305.55	305.50	305.22	299.22	305.72	300.72
M-6	310.69	312.99	2.30	305.59	305.52	305.19	299.19	305.69	300.69
M-7	309.87	312.94	3.07	306.23	306.13	305.07	298.87	305.37	300.37
M-8	310.15	312.72	2.57	305.66	305.59	305.15	298.85	305.45	300.45

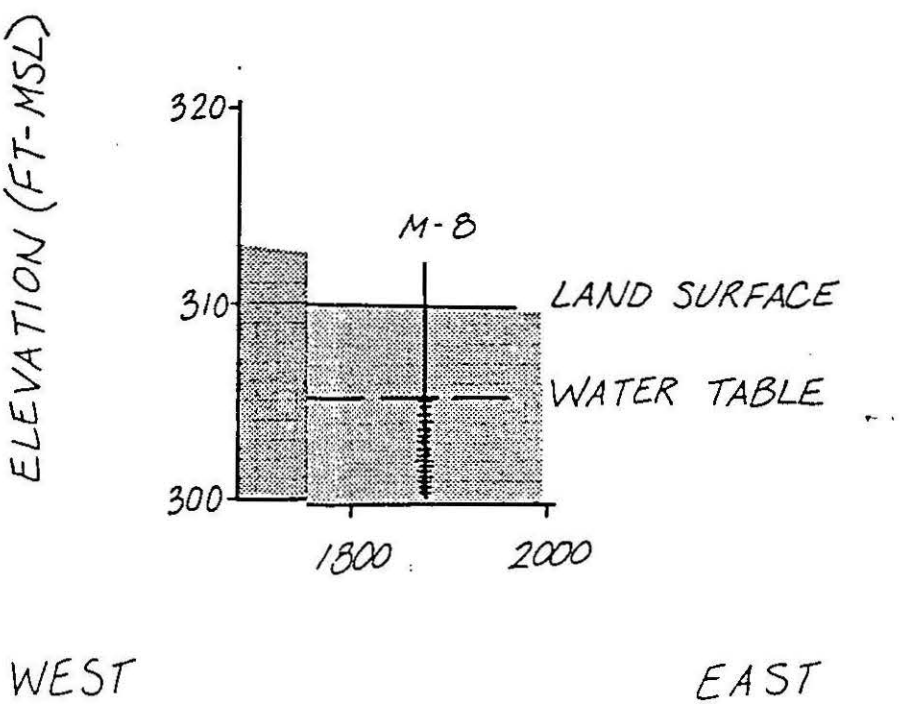
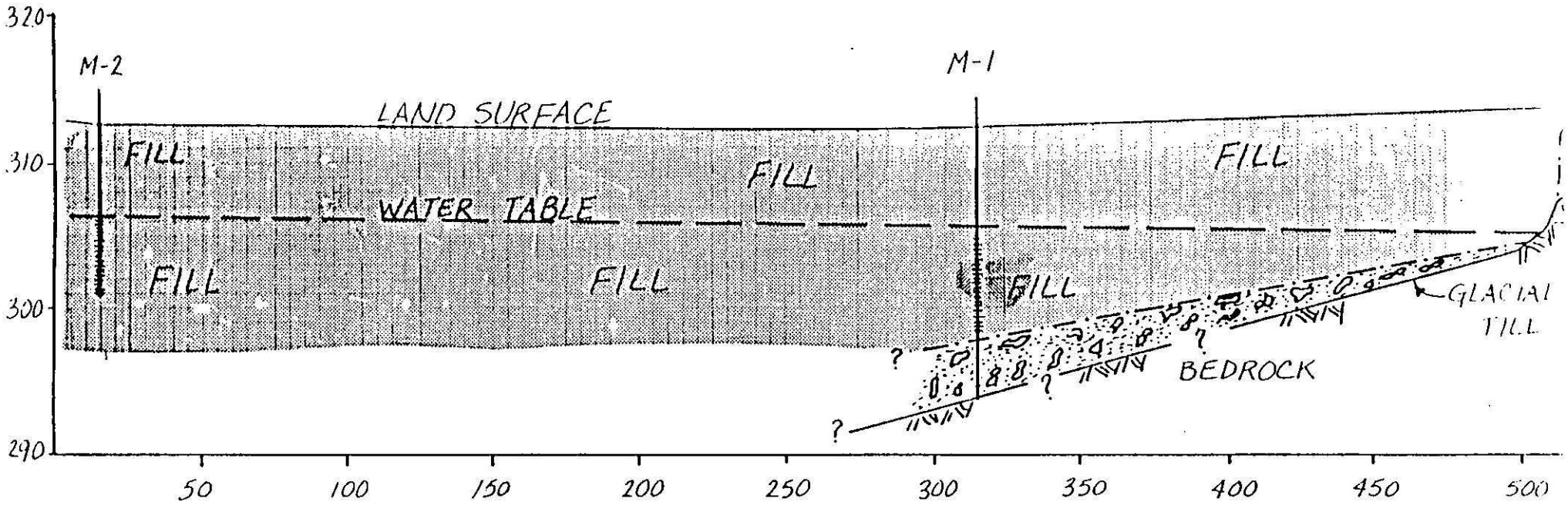

ELEVATION (FT-MSL)
320
310
300
M-8
LAND SURFACE
WATER TABLE
1800
2000
WEST
EAST

FIGURE 3

B - B'

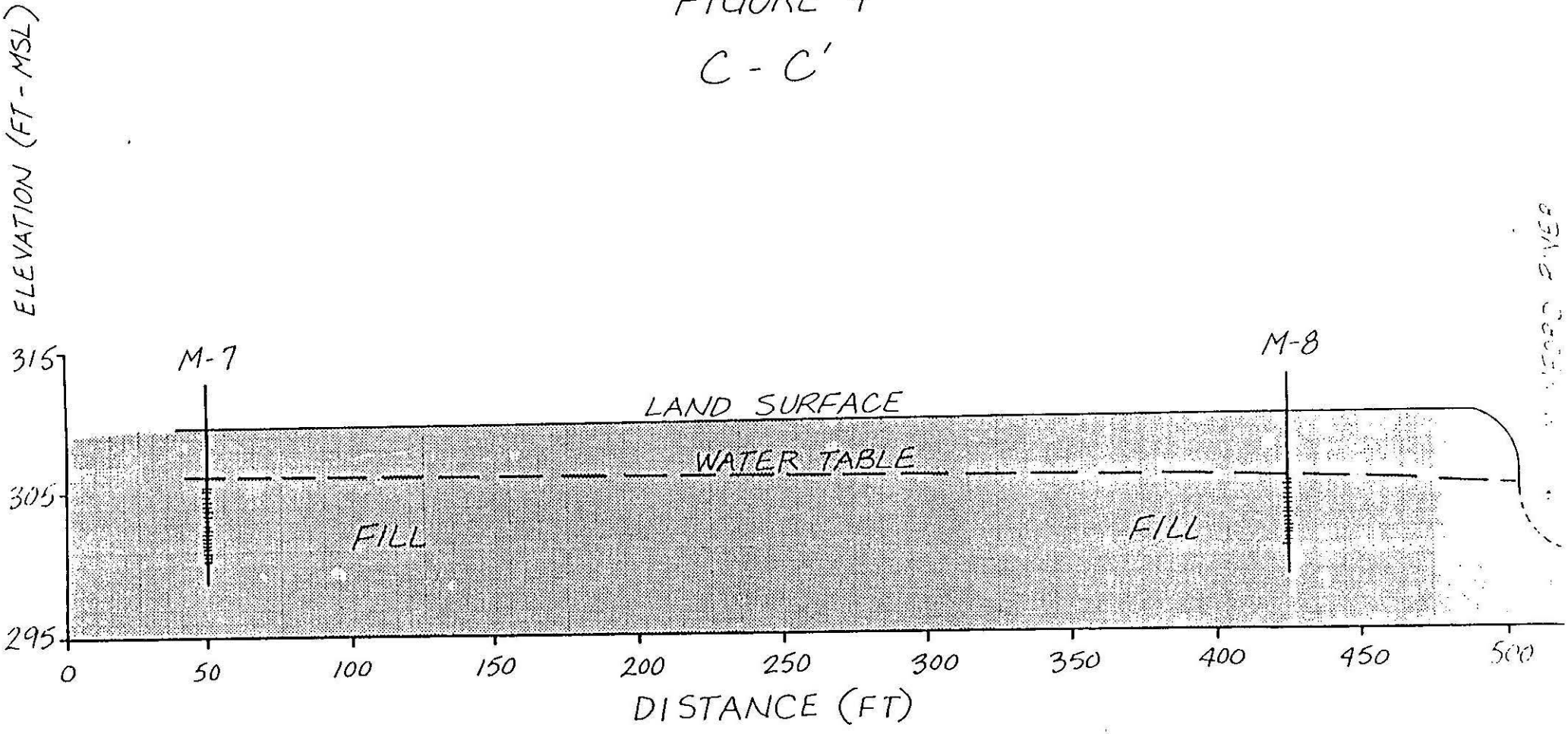


VERTICAL: 1" = 10'

HORIZONTAL: 1" = 50'

FIGURE 4

C - C'



VERTICAL: 1" = 10'

HORIZONTAL: 1" = 50'

To place the above concentrations of volatile organic compounds in some form of reference, they should be viewed relative to Suggested No Adverse Reaction Limit (SNARL) standards. These standards were developed by EPA to be used as guidelines. Given the present knowledge of these chemical compounds, a SNARL suggests both concentrations and exposure times that an average person may endure without significant adverse reactions occuring. The SNARL's for those compounds found in the groundwater samples are as follows:

VINYL CHLORIDE	NO LIMIT SET
1,2-trans-DICHLOROETHYLENE	1 DAY - 2700 ug/l 10 DAY - 270 ug/l
TRICHLOROETHYLENE	1 DAY - 2000 ug/l 10 DAY - 200 ug/l LIFETIME - 75 ug/l
TETRACHLOROETHYLENE	1 DAY - 2300 ug/l 10 DAY - 180 ug/l LIFETIME - 40 ug/l
1,1 DICHLOROETHANE	THE SUM OF ALL TRIHALOMETHANES SHOULD NOT EXCEED 0.01 mg/l ON A LIFETIME BASIS

Review of these data would suggest that contamination is significant (10 day exposure limit or less) in M-3 (250 ug/l 1,2-trans-dichloroethylene), M-6 (950 ug/l tetrachloroethylene) and M-8 (610 ug/l 1,2 trans-dichloroethylene).

C. RIVER BOTTOM SEDIMENT QUALITY. Appendix B contains the results of the laboratory analyses for priority pollutant metals in each of the five benthic samples (B-1 through B-5) taken from the river bottom. All of the samples were characterized as dark organic peat and muck. The locations of these samples are shown on Figure 1, with the exception of B-4 and B-5 which are located outside the area depicted. B-4 is located east of the study area, about 100 feet above the large dam in the center of the Covitch property. B-5 is located west of the study area, and toward the western end of the Whitinsville Water Company property. In that the river flows west to east, B-5 is upgradient of the study area, while B-4 is downgradient.

Of the fourteen metals evaluated, only chromium appears to be cause for concern. To provide perspective, some discussion of EP Toxicity and soil samples is warranted. An EP Toxicity test evaluates both the concentration and mobility of materials such as metals in the subsurface. In terms of concentration, the leachable amount of a metal from a soil sample (ug/g) can not exceed 100 times the level set for that metal (mg/l) in the Primary Drinking Water Standards. To relate EP Toxicity in water samples to potential EP Toxicity in soil samples, multiply the Primary Drinking Water Standard for any given constituent by 2000. This conversion factor accounts for the

dilution necessary when preparing a standard soil sample for analysis. In the case of chromium, up to 410 ug/g was found in the benthic samples, and the level at which chromium is potentially EP Toxic in sediment samples is 100 ug/l.

The upgradient to downgradient (in terms of river flow) concentrations of chromium in the benthic samples were as follows:

B-5	65 ug/g
B-1	410 ug/g
B-2	250 ug/g
B-3	400 ug/g
B-4	100 ug/g

As seen, the upgradient concentration is itself moderately high, although not potentially EP Toxic. The remaining four downgradient samples all, however, exceed the criteria for delineating potential EP Toxicity. These elevated chromium concentrations can be coming from one or both of two possible sources, those being the ATF/D Arcade facility, or some unknown upgradient facility. In that ATF/D and WCI officials have stated that they have never used chromium at the Arcade facility, and because ground water samples from M-1 through M-8 showed no chromium, we must conclude that it is coming from an upgradient source.

One possible explanation of the pronounced increase in concentration between B-5 and the remaining samples (B-4 through B-1) concerns changes in the morphology of the river from the Whitinsville Water Company parcel, past the Arcade facility to the dam on the Covitch property. The dam creates a large head pong (Whitin Pond) that extends back up the river past the ATF/D Arcade facility. As chromium laden organic material flows past the channelized portion of the river opposite the Whitinsville Water Company, it can tend to remain in suspension because of adequate flow velocity. As this material enters the head pond, however, decreased flow velocity would tend to facilitate settling. As the organics degrade, the concentration of incorporated metals such as chromium would increase in the sediments. In that both textile and tannery facilities (which normally use chromium in their processes) were reported in operation further up-river (unchecked by CEH), this settling and accretion theory seems to be the most plausible explanation for the levels of contamination noted in the benthic samples.

SUMMARY

The subsurface area of this investigation is generally comprised of less than 15 feet of foundry fill overlying river bottom sediments which overlie bedrock. The site lies along the northern bank of the Mumford River which flows from west to east. Ground water generally flows south beneath the site, discharging to the river at a seepage velocity of approximately 23 feet per year.

Ground water quality beneath the site is generally good with respect to priority pollutant metals, but three monitoring wells (M-3, M-6 and M-8) showed evidence of volatile organic contamination.

The Mumford River bottom sediments are heavily contaminated with chromium in the Whitin Pond area sbove the large dam on the Covitch property. The heaviest contamination appears to range from the dam, up-river past the ATF/D Arcade facility. A source upgradient of ATF/D is most likely responsible for the elevated chromium levels noted in the benthic samples.

APPENDIX A

DRILLERS LOGS

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640
Springfield, MA 01103 — 413-733-1232

CLIENT: CEH
PROJECT NAME: ATF Davidson
LOCATION: Whitinsville, MA

BORING NUMBER: M-1
SHEET No. 1 of 1

DRILLER: T. Roe
INSPECTOR: M. Eichler
DATE START: 7/8/85
DATE FINISH: 7/8/85

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

FILE NO.:
SURFACE ELEV.:
LINE & STATION:
OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	4	12	14	16"			
5'	S2	5.0-6.5	1	2	1	14"			Black Br. Fine Sand, Little Silt, Med.-Crs. Sand, Occasional Cobbles, Bricks
10'	S3	10.0-11.5	1	2	10	10"			
15'	S4	15.0-16.5	13	21	20	18"		14.5	
	S5	18.3	100/0					18.3	Grey Br. Fine-Crs. Sand and Gravel Little Silt, Occasional Cobbles and Boulders
20'									

HSA and Spoon Refusal @ 18.3
Water @ 8.8

Installed Monitor Well @ 14.0
Materials:
5.0 - 1½" PVC Screen
11.0 - 1½" PVC Riser
1 - Bag Ottawa Sand
50 - lbs. Bentonite
1 - Bag Sand Mix
1 - Locking Protector Pipe

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V.Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:
Developing Time:
M-1 - M-8 2½ Hrs.
Developed Consecutively
COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-2

SHEET No. 1 of 1

DRILLER: T. Roe

INSPECTOR: M. Eichler

DATE START: 7/8/85

DATE FINISH: 7/8/85

ARCHITECT ENGINEER:

FILE NO.:

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	3	8	11	14"			
5'	S2	5.0-6.5	2	4	6	18"			Br. Black Fine Sand, Some Silt, Little Med.-Crs. Sand, Fine Gravel, Occasional Cobbles, Bricks, Foundry Fill
10'	S3	10.0-11.5	1	3	4	10"			
								12.0	
15'									Bottom of Boring 12.0 Water @ 7.3 Installed Monitor Well @ 12.0 Materials: 5.0 - 1½" PVC Screen 9.0 - 1½" PVC Riser ½ - Bag Sand 25 - lbs. Bentonite Pelle 1 - Bag Sand Mix 1 - Locking Protector Pipe

SAMPLE IDENTIFICATION

S- —— SPLIT SPOON
T —— THIN WALL TUBE
U —— UNDISTURBED PISTON
O —— OPEN END ROD
W —— WASH SAMPLE
A —— AUGER SAMPLE

PENETRATION RESISTANCE

140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V.Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-3

SHEET No. 1 of 1

DRILLER: T. Roe

ARCHITECT ENGINEER:

FILE NO.:

INSPECTOR: M. Eichler

DATE START: 7/8/85

DATE FINISH: 7/8/85

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	5	17	11	18"			Br. Black Fine-Crs. Sand, Some Silt, Fine Gravel, Asphalt, Few Cobbles, Boulders
5'	S2	5.0-5.7	1	100/2		8"		7.0	
10'	S3	10.0-11.5	4	5	6	8"		11.5	Dark Br. Black Fine-Crs. Sand, Little Silt, Fine Gravel
15'									Bottom of Boring 11.5 Water @ 5.0 Installed Monitor Well @ 10.0 Materials: 5.0 - 1½" PVC Screen 7.0 - 1½" PVC Riser 1 - Bag Ottawa Sand 25 - lbs. Bentonite Pellet 1 - Bag Sand Mix 1 - Locking Protector Pip

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-4

SHEET No. 1 of 1

DRILLER: T. Roe

ARCHITECT ENGINEER:

FILE NO.:

INSPECTOR: M. Eichler

DATE START: 7/9/85

DATE FINISH: 7/9/85

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	3	4	4	6"			
5'	S2	5.0-6.5	2	2	9	10"			Black Br. Fine-Crs. Sand, Some Fine Gravel, Little Silt, Occasional Cobbles, Bricks, Many Cobbles, Boulders
10'	S3	10.0-11.5	2	2	4	4"			
								11.5	
15'									Bottom of Boring 11.5 Water @ 5.5 Installed Monitor Well @ 10.0 Materials: 5.0 - 1½" PVC Screen 7.0 - 1½" PVC Riser 1 - Bag Ottawa Sand 50 - lbs. Bentonite Pellet 1 - Bag Sand Mix 1 - Locking Protector Pip

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-5

SHEET No. 1 of 1

DRILLER: T. Roe

INSPECTOR: M. Eichler

DATE START: 7/8/85

DATE FINISH: 7/8/85

ARCHITECT ENGINEER:

FILE NO.:

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	4	5	8	6"			
5'	S2	5.0-6.5	2	4	1	6"			Black Br. Fine-Crs. Sand, Some Fine Gravel, Little Silt, Occasional Cobbles, Cement, Ash
10'	S3	10.0-11.5	1	2	3	10"			
								11.5	
15'									Bottom of Boring 11.5 Water @ 5.5 Installed Monitor Well @ 10.0 Materials: 5.0 - 1½" PVC Screen 7.0 - 1½" PVC Riser 1 - Bag Ottawa Sand 50 - lbs. Bentonite Pelle 1 - Bag Sand Mix 1 - Locking Protector Pipe

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE

PENETRATION RESISTANCE

140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

1 Hr. Standby Time to Clear Utilities

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-6

SHEET No. 1 of 1

DRILLER: T. Roe

INSPECTOR: M. Eichler

DATE START: 7/9/85

DATE FINISH: 7/9/85

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

FILE NO.:

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	6	10	9	12"			
5'	S2	5.0-6.5	6	3	3	12"			Black Br. Fine-Crs. Sand, Some Fine Gravel, Few Cobbles, Boulders, Ash, Little Silt
10'	S3	10.0-11.5	1	1	1	8"			
								11.5	
15'									Bottom of Boring 11.5 Water @ 5.5 Installed Monitor Well @ 10.0 Materials: 5.0 - 1½" PVC Screen 7.0 - 1½" PVC Riser 1 - Bag Ottawa Sand 50 - lbs. Bentonite Pellet 1 - Bag Sand Mix 1 - Locking Protector Pip

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-7

SHEET No. 1 of 1

DRILLER: T. Roe

INSPECTOR: M. Eichler

DATE START: 7/9/85

DATE FINISH: 7/9/85

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

FILE NO.:

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	1	4	8	12"			
5'	S2	5.0-6.5	6	20	13	16"			Br. Black Fine-Crs. Sand, Some Gravel, Little Silt, Many Cobbles, Brick, Ashes
	S3	9.5-11.0	3	2	1	10"			
10'								11.0	
15'									Bottom of Boring 11.0 Water @ 4.8 Installed Monitor Well @ 9.5 Materials: 5.0 - 1½" PVC Screen 6.0 - 1½" PVC Riser 1 - Bag Ottawa Sand 50 - lbs. Bentonite Pellet 1 - Bag Sand Mix 1 - Locking Protector Pip

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

NEW ENGLAND BORING CONTRACTORS OF CONN. INC.

Glastonbury, CT 06033 — 203-633-4640

Springfield, MA 01103 — 413-733-1232

CLIENT: CEH

PROJECT NAME: ATF Davidson

LOCATION: Whitinsville, MA

BORING NUMBER: M-8

SHEET No. 1 of 1

DRILLER: T. Roe

ARCHITECT ENGINEER:

FILE NO.:

INSPECTOR: M. Eichler

DATE START: 7/9/85

DATE FINISH: 7/9/85

	Casing	Sampler	Core Barrel
TYPE	HSA	SS	
SIZE I.D.	3-3/8"	1-3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

SURFACE ELEV.:

LINE & STATION:

OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	SAMPLE REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	S1	0-1.5	5	5	8	12"			
5'	S2	5.0-6.5	2	4	6	8"			Black Br. Fine-Crs. Sand, Some Gravel, Little Silt, Bricks, Ashes, Few Cobbles and Boulders
10'	S3	9.8-11.3	16	13	4	14"		11.3	
15'									Bottom of Boring 11.3 Water @ 5.0 Installed Monitor Well A 9.7 Materials: 5.0 - 1½" PVC screen 6.5 - 1½" PVC Riser 1 - Bag Ottawa Sand 50 - lbs. Bentonite Pellet 1 - Bag Sand Mix 1 - Locking Protector Pi

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

APPENDIX B

LABORATORY DATA

LOCATION: ATF Davidson, Whitinsville, MA

ENGINEERS: Caswell, Eichler, and Hill

SAMPLING DATE: 7/18/85

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND./TEMP. umhos/cm	°C	pH
M-1	14'	1.5"	0950	8.31'	425	20.0	7.25
M-2	12'	1.5"	1000	8.75'	300	19.5	8.50
M-3	10'	1.5"	1010	6.90'	260	21.5	6.35
M-4	10'	1.5"	1015	7.68'	225	24.0	8.20
M-5	10'	1.5"	1017	7.35'	365	24.0	7.30
M-6	10'	1.5"	1018	7.47'	235	25.0	6.85
M-7	9.5'	1.5"	1020	6.81'	325	24.0	9.80
M-8	9.8'	1.5"	1023	7.13'	165	22.0	7.30

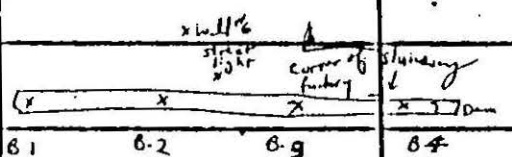
Total depths come from the well plans.

Proj. No.	Project Name					No. of containers							Remarks
	A TF Davidson												
Samplers: (Signature) [illegible] Matt Eichler													
Sta. No.	Date	Time	Comp.	Grab	Station Location		VOA - EPA 624	TCA - [illegible]	[illegible]	pH / spec / temp	gals	Oil-Grease [illegible]	Static level(s) / Well Depth / [illegible]
M-1	7/18/85	1415		✓		3	✓	✓	✓	[illegible]	1.5		8.31' / 14' / [illegible]
M-2		1432		✓			✓	✓	✓	[illegible]	0.9		8.75' / 12' / [illegible]
M-3		1520		✓			✓	✓	✓	[illegible]	0.8		6.90' / 10' / 101
M-4		1345		✓			✓	✓	✓	[illegible]	0.6		7.68' / 10' / 101
M-5		1330		✓			✓	✓	✓	[illegible]	0.7		7.35' / 10' / 101
M-6		1115		✓			✓	✓	✓	[illegible]	0.7		7.47' / 10' / [illegible]
M-7		1110		✓			✓	✓	✓	[illegible]	0.7		6.81 / 9.5' / 102
M-8		1055		✓		↓	✓	✓	✓	[illegible]	0.7		7.13' / 9.8' / 1023
M-3		1510		✓								✓	sample had to be pumped [illegible] Oil & Grease [illegible]

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[illegible]	7/18 1955				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks
		[illegible]	7/18/85 2000	

Proj. No.	Project Name					No. of containers						Remarks
	ATF Davidson, Whitinsville, MA											
Samplers: (Signature)												
Sta. No.	Date	Time	Comp.	Grab	Station Location		(Oil & Grease)	Oil & Grease				
B-1	7/18/95	1610		✓	see map below	1	✓	✓	-			
2		1625		✓			✓	✓				
3		1640		✓			✓	✓				
4		1650		✓			✓	✓				
												

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	7/18 1955				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
			7/18/95 2000		

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler & Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 7-19-85 (8:10)

Lab Number: 5008

Date Reported: 8-13-85

Please find attached results for Volatile Organic Compounds, Total Cyanide, Oil and Grease, Barium, and Priority Pollutant Metals.

Russell K. Scott

Technical Director

Date 8/13/85

Proj. No.	Project Name
	ATF Davidson

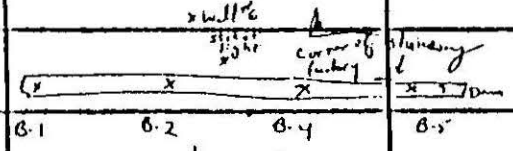
Samplers: (Signature) [illegible] Matt Eichler

Sta. No.	Date	Time	Comp.	Grab	Station Location	No. of containers	VOC	EPA 624 [illegible]	[illegible]	[illegible]	[illegible]	Oil & Grease [illegible]	Remarks		
													Static level	Total Depth	[illegible]
M-1	7/18/85	1415		✓		7	✓	✓	✓	[illegible]	1.5		8.31'	14'	990
M-2		1432		✓			✓	✓	✓	[illegible]	0.9		8.75'	12'	1000
M-3		1520		✓			✓	-	✓	[illegible]	0.8		6.90'	10'	1010
M-4		1300		✓			✓	✓	✓	[illegible]	0.6		7.68'	10'	1015
M-5		1335		✓			✓	✓	✓	[illegible]	0.7		7.36'	10'	1017
M-6		1115		✓			✓	✓	✓	[illegible]	0.7		7.17'	10'	[illegible]
M-7		1110		✓			✓	✓	✓	[illegible]	0.7		6.81'	9.5'	[illegible]
M-7		1055		✓			✓	✓	✓	[illegible]	0.7		7.13'	9.8'	1023
M-3		1510		✓								✓	Sample had to be pumped [illegible] Oil & Grease [illegible]		

Relinquished by: (Signature)	Date/Time		Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[illegible]	7/18	1555				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time		Remarks
		[illegible]	7/18/85	2000	

Proj. No.	Project Name					No. of containers							Remarks
	ATF Davidson, Whitinsville, MA												
Samplers: (Signature)													
Sta. No.	Date	Time	Comp.	Grab	Station Location		(Nonfiltered)	Oil & Grease					
B-1	7/18/85	1610		✓	see map below	1	✓	✓					
2		1625		✓			✓	✓					
3		1640		✓			✓	✓					
4		1650		✓			✓	✓					
													
					Whitin Pond								

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	7/18 1955				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
			7/19/85 2000		

Caswell, Eichler, & Hill
Laboratory Number 5008
8-13-85

Field Identification: M-1 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-9	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-17	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-17	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-17	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-17	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-17	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-17	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-17	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-17	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-17	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-17	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-17	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-17	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-17	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-17	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.028

Field Identification: M-2 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-10	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-18	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-18	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-18	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-18	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-18	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-18	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-18	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-18	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-18	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-18	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-18	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-18	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-18	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-18	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.045

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Resource Analysts, Incorporated

Field Identification: M-3 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-11	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-19	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-19	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-19	Barium, recoverable (mg/L)	8-8-85	303A	2	0.34
5008-19	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-19	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-19	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-19	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-19	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-19	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-19	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-19	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-19	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-19	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-19	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.022
5008-29	Oil and Grease (mg/L)	7-25-85	413.2	1	<5

Field Identification: M-4 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-12	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-20	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-20	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-20	Barium, recoverable (mg/L)	8-8-85	303A	2	1.0
5008-20	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-20	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-20	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-20	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-20	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-20	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-20	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-20	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-20	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-20	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-20	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.021

Reference: 1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Field Identification: M-5 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-13	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-21	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-21	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-21	Barium, recoverable (mg/L)	8-8-85	303A	2	2.9
5008-21	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-21	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-21	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-21	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-21	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-21	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-21	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-21	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-21	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-21	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-21	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.016

Field Identification: M-6 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-14	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-22	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-22	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-22	Barium, recoverable (mg/L)	8-8-85	303A	2	0.91
5008-22	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-22	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-22	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-22	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-22	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-22	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-22	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-22	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-22	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-22	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-22	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.020

Reference: 1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Field Identification: M-7 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-15	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-23	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-23	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-23	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-23	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-23	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-23	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-23	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-23	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-23	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-23	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-23	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-23	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-23	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.016

Field Identification: M-8 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-16	Total Cyanide (mg/L)	8-2-85	335.2	1	0.03
5008-24	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-24	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-24	Barium, recoverable (mg/L)	8-8-85	303A	2	1.2
5008-24	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-24	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-24	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-24	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-24	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-24	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-24	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-24	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-24	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-24	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-24	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.010

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Field Identification: B-1 Matrix: Solid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-25	Silver, recoverable (ug/g)	8-9-85	3050/303A	1/2	<0.5
5008-25	Arsenic, recoverable (ug/g)	8-6-85	3050/304	1/2	26
5008-25	Barium, recoverable (ug/g)	8-8-85	3050/303A	1/2	160
5008-25	Beryllium, recoverable (ug/g)	8-9-85	3050/303C	1/2	1.4
5008-25	Cadmium, recoverable (ug/g)	8-7-85	3050/303A	1/2	1.9
5008-25	Chromium, recoverable (ug/g)	8-9-85	3050/303A	1/2	410
5008-25	Copper, recoverable (ug/g)	8-7-85	3050/303A	1/2	110
5008-25	Mercury, recoverable (ug/g)	7-23-85	7471	1	0.34
5008-25	Nickel, recoverable (ug/g)	8-9-85	3050/303A	1/2	17
5008-25	Lead, recoverable (ug/g)	8-7-85	3050/303A	1/2	150
5008-25	Antimony, recoverable (ug/g)	8-12-85	3050/303A	1/2	<80
5008-25	Selenium, recoverable (ug/g)	7-25-85	3050/304	1/2	<1
5008-25	Thallium, recoverable (ug/g)	8-12-85	3050/303A	1/2	<60
5008	Zinc, recoverable (ug/g)	8-7-85	3050/303A	1/2	520

Field Identification: B-2 Matrix: Solid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-26	Silver, recoverable (ug/g)	8-9-85	3050/303A	1/2	<0.5
5008-26	Arsenic, recoverable (ug/g)	8-6-85	3050/304	1/2	26
5008-26	Barium, recoverable (ug/g)	8-8-85	3050/303A	1/2	140
5008-26	Beryllium, recoverable (ug/g)	8-9-85	3050/303C	1/2	1.1
5008-26	Cadmium, recoverable (ug/g)	8-7-85	3050/303A	1/2	2.5
5008-26	Chromium, recoverable (ug/g)	8-9-85	3050/303A	1/2	250
5008-26	Copper, recoverable (ug/g)	8-7-85	3050/303A	1/2	45
5008-26	Mercury, recoverable (ug/g)	7-23-85	7471	1	0.39
5008-26	Nickel, recoverable (ug/g)	8-9-85	3050/303A	1/2	8.3
5008-26	Lead, recoverable (ug/g)	8-7-85	3050/303A	1/2	58
5008-26	Antimony, recoverable (ug/g)	8-12-85	3050/303A	1/2	<80
5008-26	Selenium, recoverable (ug/g)	7-25-85	3050/304	1/2	<1
5008-26	Thallium, recoverable (ug/g)	8-12-85	3050/303A	1/2	<60
5008-26	Zinc, recoverable (ug/g)	8-7-85	3050/303A	1/2	460

Reference:
1. EPA SW 846, 2nd Edition
2. Standard Methods, 16th Edition

Field Identification: B-3 Matrix: Solid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-27	Silver, recoverable (ug/g)	8-9-85	3050/303A	1/2	<0.5
5008-27	Arsenic, recoverable (ug/g)	8-6-85	3050/304	1/2	28
5008-27	Barium, recoverable (ug/g)	8-8-85	3050/303A	1/2	180
5008-27	Beryllium, recoverable (ug/g)	8-9-85	3050/303C	1/2	1.5
5008-27	Cadmium, recoverable (ug/g)	8-7-85	3050/303A	1/2	2.9
5008-27	Chromium, recoverable (ug/g)	8-9-85	3050/303A	1/2	400
5008-27	Copper, recoverable (ug/g)	8-7-85	3050/303A	1/2	110
5008-27	Mercury, recoverable (ug/g)	7-23-85	7471	1	0.35
5008-27	Nickel, recoverable (ug/g)	8-9-85	3050/303A	1/2	12
5008-27	Lead, recoverable (ug/g)	8-7-85	3050/303A	1/2	150
5008-27	Antimony, recoverable (ug/g)	8-12-85	3050/303A	1/2	<80
5008-27	Selenium, recoverable (ug/g)	7-25-85	3050/304	1/2	<1
5008-27	Thallium, recoverable (ug/g)	8-12-85	3050/303A	1/2	<60
5008-27	Zinc, recoverable (ug/g)	8-7-85	3050/303A	1/2	920

Field Identification: B-4 Matrix: Solid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-28	Silver, recoverable (ug/g)	8-9-85	3050/303A	1/2	<0.5
5008-28	Arsenic, recoverable (ug/g)	8-6-85	3050/304	1/2	26
5008-28	Barium, recoverable (ug/g)	8-8-85	3050/303A	1/2	120
5008-28	Beryllium, recoverable (ug/g)	8-9-85	3050/303C	1/2	1.1
5008-28	Cadmium, recoverable (ug/g)	8-7-85	3050/303A	1/2	0.9
5008-28	Chromium, recoverable (ug/g)	8-9-85	3050/303A	1/2	100
5008-28	Copper, recoverable (ug/g)	8-7-85	3050/303A	1/2	53
5008-28	Mercury, recoverable (ug/g)	7-23-85	7471	1	0.35
5008-28	Nickel, recoverable (ug/g)	8-9-85	3050/303A	1/2	9
5008-28	Lead, recoverable (ug/g)	8-7-85	3050/303A	1/2	350
5008-28	Antimony, recoverable (ug/g)	8-12-85	3050/303A	1/2	<80
5008-28	Selenium, recoverable (ug/g)	7-25-85	3050/304	1/2	<1
5008-28	Thallium, recoverable (ug/g)	8-12-85	3050/303A	1/2	<60
5008-28	Zinc, recoverable (ug/g)	8-7-85	3050/303A	1/2	310

Reference: 1. EPA SW 846, 2nd Edition
2. Standard Methods, 16th Edition

CHAIN OF CUSTODY DOCUMENTATION

CASWELL EICHLER & HILL

CLIENT ATF DAVIDSON

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT MATT EICHLER

SAMPLING LOCATION

SAMPLE COLLECTOR MATT EICHLER

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
B-5 (Water Company) Mumford River Benthic Sampler Date 8/14/85 Time 3:30	5153	⊗ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ⊗ G/T/ 1000 mL	○ field / ○ lab / ⊗ none	NONE	PRIORITY POLLUTANT METALS
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		
Date Time		○ Solid / ○ Liquid / ○ Other	○ P/ mL / ○ G/ mL / ○ G/T/ mL	○ field / ○ lab / ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By: [signature]	8/14/85	1815	Received For Laboratory By: David N. Pease, Resource Analysts, Incorporated	8/14/85	1815

Caswell, Eichler and Hill
Laboratory Number: 5153
8-27-85

Field Identification: B-5 (Water Company) Mumford River BENTHIC Matrix: Solid
Laboratory Number: 5153-1

Parameter	Date analyzed	Method	Ref.	Concentration
Silver, recoverable (ug/g)	8-22-85	3050/303A	1/2	0.86
Arsenic, recoverable (ug/g)	8-23-85	3050/304	1/2	16
Beryllium, recoverable (ug/g)	8-22-85	3050/303C	1/2	0.57
Cadmium, recoverable (ug/g)	8-19-85	3050/303A	1/2	0.38
Chromium, recoverable (ug/g)	8-19-85	3050/303A	1/2	65
Copper, recoverable (ug/g)	8-19-85	3050/303A	1/2	10
Mercury, recoverable (ug/g)	8-21-85	7471	1	<0.4
Nickel, recoverable (ug/g)	8-22-85	3050/303A	1/2	3.8
Lead, recoverable (ug/g)	8-23-85	3050/303A	1/2	14
Antimony, recoverable (ug/g)	8-23-85	3050/303A	1/2	<5
Selenium, recoverable (ug/g)	8-22-85	3050/304	1/2	<10
Thallium, recoverable (ug/g)	8-23-85	3050/303A	1/2	<5
Zinc, recoverable (ug/g)	8-19-85	3050/303A	1/2	150

Reference: 1. EPA SW 846, 2nd Edition
2. Standard Methods, 16th Edition

Resource Analysts, Incorporated

Lab Number:	5008-1
Sample Designation:	M-1
Date analyzed:	7-24-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-2
Sample Designation: M-2
Date analyzed: 7-24-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-3
Sample Designation: M-3
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	190	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	250	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	10	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-3 (Laboratory Duplicate)
Sample Designation: M-3
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	210	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	250	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	10	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-4
Sample Designation: M-4
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-5
Sample Designation: M-5
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-6
Sample Designation: M-6
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	24
VINYL CHLORIDE	BDL	24
CHLOROETHANE	BDL	12
BROMOMETHANE	BDL	24
METHYLENE CHLORIDE	BDL	12
TRICHLOROFLUOROMETHANE	BDL	12
1,1-DICHLOROETHYLENE	BDL	12
1,1-DICHLOROETHANE	BDL	12
1,2-trans-DICHLOROETHYLENE	15	12
CHLOROFORM	BDL	12
1,2-DICHLOROETHANE	BDL	12
1,1,1-TRICHLOROETHANE	BDL	12
CARBON TETRACHLORIDE	BDL	12
BROMODICHLOROMETHANE	BDL	12
1,2-DICHLOROPROPANE	BDL	12
1,3-trans-DICHLOROPROPENE	BDL	12
TRICHLOROETHYLENE	30	12
BENZENE	BDL	12
1,3-cis-DICHLOROPROPENE	BDL	12
1,1,2-TRICHLOROETHANE	BDL	12
2-CHLOROETHYL VINYL ETHER	BDL	12
DIBROMOCHLOROMETHANE	BDL	12
BROMOFORM	BDL	12
TETRACHLOROETHYLENE	950	12
1,1,2,2-TETRACHLOROETHANE	BDL	12
TOLUENE	BDL	12
CHLOROBENZENE	BDL	12
ETHYLBENZENE	BDL	12
ACETONE	BDL	60
CARBON DISULFIDE	BDL	12
THF	BDL	60
MEK	BDL	60
MIBK	BDL	60
STYRENE	BDL	12
XYLENES	BDL	12

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-7
Sample Designation: M-7
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-8
Sample Designation: M-8
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	14
VINYL CHLORIDE	260	14
CHLOROETHANE	BDL	7
BROMOMETHANE	BDL	14
METHYLENE CHLORIDE	BDL	7
TRICHLOROFLUOROMETHANE	BDL	7
1,1-DICHLOROETHYLENE	BDL	7
1,1-DICHLOROETHANE	Trace	7
1,2-trans-DICHLOROETHYLENE	610	7
CHLOROFORM	BDL	7
1,2-DICHLOROETHANE	BDL	7
1,1,1-TRICHLOROETHANE	BDL	7
CARBON TETRACHLORIDE	BDL	7
BROMODICHLOROMETHANE	BDL	7
1,2-DICHLOROPROPANE	BDL	7
1,3-trans-DICHLOROPROPENE	BDL	7
TRICHLOROETHYLENE	30	7
BENZENE	BDL	7
1,3-cis-DICHLOROPROPENE	BDL	7
1,1,2-TRICHLOROETHANE	BDL	7
2-CHLOROETHYL VINYL ETHER	BDL	7
DIBROMOCHLOROMETHANE	BDL	7
BROMOFORM	BDL	7
TETRACHLOROETHYLENE	Trace	7
1,1,2,2-TETRACHLOROETHANE	BDL	7
TOLUENE	BDL	7
CHLOROBENZENE	BDL	7
ETHYLBENZENE	BDL	7
ACETONE	BDL	35
CARBON DISULFIDE	BDL	7
THF	BDL	35
MEK	BDL	35
MIBK	BDL	35
STYRENE	BDL	7
XYLENES	BDL	7

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-30
Sample Designation: Trip Blank
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

DBH

Complete

ADDITIONAL INVESTIGATIONS

ATF/DAVIDSON ARCADE FACILITY
COVITCH PROPERTIES
MUMFORD RIVER

PREPARED FOR

ATF/DAVIDSON COMPANY
WHITINSVILLE, MASSACHUSETTS

PREPARED BY

CASWELL, EICHLER & HILL, INC.
PORTSMOUTH, NEW HAMPSHIRE

JANUARY 1986

Caswell, Eichler and Hill, Inc.
GEOLOGY HYDROLOGY GEOPHYSICS
P.O. Box 4696
Portsmouth, NH 03801
TEL. (603) 431-4899

January 14, 1986

White Consolidated Industries, Inc.
11770 Berea Road
Cleveland, Ohio 44111

Attn: Mr. Dan Marques, P.E.

Re: Our 10-29-85 letter (concerning the 10-24-85 meeting with DEQE - see copy Appendix A)

Dear Dan:

The purpose of this transmittal is to report the laboratory results for items 2, 3, 4 and 5 of the above referenced letter. Each of these items will be addressed below; copies of our 10-29-85 letter and all laboratory data are appended.

#2

No additional organic compounds were found in any of the Arcade or Covitch property samples. See Appendix B for laboratory results.

#3

Concentrations of arsenic, barium and zinc in soil samples taken from MC-7 and MC-10 are characteristic of expected natural background levels. None show evidence of contamination. See Appendix C for laboratory results.

#4

Conductivities generally dropped or remained the same since our 7-18-85 sampling.

No problem levels of arsenic, barium or zinc were detected; M-5 and M-8, however, still exceeded drinking water standards for barium.

Regarding volatile organic compounds, M-3 improved in water quality; M-6 and M-8, however, degraded. In September of 1986, we will graph the results of all quarterly samples to be taken (See 10-29-85 letter for schedule), and analyse water quality trends. We will, however, be transmitting the quarterly results to you as we receive them.

#5

As the laboratory results indicate, (Appendix E), there is a great deal of chromium present in the Mumford River bottom sediments, but virtually none of it appears to be mobile. The greatest concentrations of chromium (2300 ug/g) were found in B-5 and B-7 which are both located well up-river (west) of the ATF/D Arcade facility. The sketch map included with the laboratory data shows the sampling locations and characterizes the nature of the sediments.

Of particular interest, B-5 was noted to exhibit a distinct color change about a foot below the river/sediment interface. The top layer (B-5A) was light brown silty river/bottom sediments, while the lower layer (B-5B) was dark brown silty river bottom sediments. Each layer was sampled separately, and the results show the greatest occurrance of chromium is in the upper portion of the sediments.

The results of the EP Toxicity testing clearly indicates that a retardation agent is affecting the mobility of the chromium. When this much chromium is present, but virtually none of it is extractable, tannery wastes appear to be the likely source. The oils used in the process are repellent to water by nature. This serves to further reduce the mobility of the chromium that is already chealated with the organic tanning wastes. Textile refining and dying wastes can apparently exhibit similar properties. Both types of industries are reported to have been in operation up-river in the past. We have not attempted to verify these reports.

In that ATF/D does not own the river bottom, and because the source of chromium contamination is clearly up-river of the Arcade facility, we recommend that you make the date available to DEQE, and remove yourselves from any further responsibilities in this regard.

This letter and these appended data serve to answer the DEQE's additional questions regarding the Covitch property. The site's soil and ground water appear to be clean, save the Building 9/Raceway area that you are presently rectifying. No further activity on our part is presently anticipated regarding the Covitch property.

The next quarterly sampling of the Arcade wells is scheduled for February 12, 1986. At that time we will be recording pH, conductivity and temperature, and we will be sampling for volatile organic compounds (EPA 624). We recommend that you ask the DEQE to suspend the need for further arsenic, barium and zinc testing. The results to date do not warrent further investigation. Please let us know of their decision.

Should you have any questions concerning this letter or data, please call.

Very truly yours,
CASWELL, EICHLER & HILL, INC.

Matthew F. Eichler III
Principal

APPENDIX A

Caswell, Eichler and Hill, Inc.
GEOLOGY HYDROLOGY GEOPHYSICS
P.O. Box 4696
Portsmouth, NH 03801
TEL. (603) 431-4899

October 29, 1985

White Consolidated Industries, Inc.
11770 Berea Road
Cleveland, Ohio 44111

Attn: Mr. Dan Marques, P.E.

Re: 10-24-85 Meeting at DEQE Offices, Worcester, MA

Dear Dan:

Per the agreements arrived at during our meeting with DEQE, CEH had been given five action items to pursue. They were:

1. Research the availability of a comprehensive hazardous materials handling text.

2. Instruct RAI to evaluate the ten highest peaks of organic chemicals present (other than those chemical compounds included in the EPA 624 analysis already completed) in each of the Arcade water samples (M-1 through M-8), the three auger probe soil samples (AP-104, S-4; AP-105, S-1; AP-105, S-3) taken from the Building 9/Raceway area, and the Covitch property water samples (MC-1, 2, 3, 7, 10, 11, 12, 13, 14 and 15).

3. Select soil samples taken during monitoring well construction from MC-7 and MC-10, and have them tested for barium, arsenic and zinc.

4. Determine a quarterly sampling schedule for the Arcade monitoring wells to include volatile organic compounds (EPA 624, and others to be determined by outcome of #2 above), barium, arsenic, zinc, pH, conductivity and temperature.

5. Take additional benthic samples from the Mumford River, and conduct an EP Toxicity Test on each sample.

To date, the following actions have been taken on the above five items:

1. The hazardous materials text:

   TITLE: MATERIAL SAFETY DATA SHEETS COLLECTION (2 Vols.)

   ORDER: GENIUM PUBLISHERS
   1145 CATALYN STREET
   SCHENECTADY, NY 12303-1836

2. All tasks discussed have been begun. A preliminary progress report should be forthcoming in several weeks.

3. The soil samples were delivered to RAI, and the data should be available in several weeks.

4. The quarterly sampling schedule is as follows:

   1st November 14, 1985
   2nd February 12, 1986
   3rd May 14, 1986
   4th August 13, 1986

5. CEH and RAI will be collecting the benthic samples on November 14, 1985. Laboratory data should be completed several weeks thereafter.

Several other WCI action items were discussed during our meeting. To summarize our notes:

1. <u>Building 9/Raceway area</u>

   a. Prepare a work plan to construct and operate a collection trench/oil separator along the raceway. This plan must include a good reason why WCI is not simply removing all of the contaminated soil and ground water, and transporting it to a secure landfill or other disposal facility.

   b. Obtain a ground water discharge permit for the recycling of water that has been separated from the oil. Forms are available from Susan Corderman.

   c. The work plan should duscuss options for determining the level of oil contamination on the south side of the raceway (monitoring well, deep test pit), and how clean up or containment will be handled should problem levels exist. The work plan should also discuss long term monitoring of the south side of the raceway. The placement of a monitoring well or two should suffice.

   d. The work plan should state that once construction of the trench/separator is completed, the raceway will be once again thoroughly cleaned.

2. River Bottom

a. Have WCI legal personnel establish who owns the Mumford River bottom.

b. If WCI or ATF/D does not own the river bottom, have WCI legal submit a brief to DEQE so stating, and denying responsibility for the presence or clean-up of chromium known to be present in the benthic sediments.

c. Check meaning of Traverse Line across the Mumford River that is labeled White Consolidated Industries on FIGURE 2, PLATE I of the Covitch property report. Also check to see if Mr. Covitch owns any of the river bottom on the other side of the traverse should it be determined that WCI or ATF/D owns the river bottom to that point. Mr. Covitch may be a slightly different case in that he owns the dam which creates Whitin Pond.

Should you have any questions regarding the content of this letter, or should you need any assistance with the Building 9/Raceway work plan, please call.

Very truly yours,
CASWELL, EICHLER & HILL, INC.

Matthew F. Eichler III
Principal

MFE/SKK

APPENDIX B

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

November 21, 1985

Mr. Matt Eichler
Caswell, Eichler and Hill
P.O. Box 4696
Portsmouth, NH 03801

Dear Matt:

This is to summarize results of our review of GC/MS data from three sets of samples sent to us for volatile organic analysis.

Lab Number	Field ID	Other compounds observed
5008-1	M-1	None
5008-2	M-2	None
5008-3	M-3	None
5008-4	M-4	None
5008-5	M-5	None
5008-6	M-6	None
5008-7	M-7	None
5008-8	M-8	None
5006-6	AP104 S-6	None
5006-7	AP105 S-1	None
5006-9	AP105 S-3	None
5070-15	MC-1	None
5070-16	MC-2	None
5070-17	MC-3	None
5070-18	MC-7	None
5070-19	MC-10	None
5070-20	MC-11	None
5070-21	MC-12	None
5070-22	MC-13	None
5070-23	MC-14	None
5070-24	MC-15	None

Magnetic tapes holding this data were reloaded into our GC/MS data system. The spectral files were used to reconstruct total ion chromatograms for each sample. The chromatograms were examined for peaks whose total ion intensity were greater than or equal to about five percent of that for the nearest internal standard. The internal standards were added to the samples at the 40ug/L level immediately prior to analysis. This would include any compounds whose concentrations were in the 2ug/L range, assuming a similar mass fragmentation behavior to that of the internal standard. Where the peaks proved to be common laboratory contaminants (e.g. methylene chloride, acetone, freon, etc.) results less than two times levels found in laboratory blanks were ignored.

If you have any questions please do not hesitate to call.

Sincerely,
RESOURCE ANALYSTS, INC.

Russell D. Foster, Jr.
Technical Director

Enclosure

RDF/myv

APPENDIX C

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler and Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # Verbal

Date Received: 10-30-85 (1115)

Lab Number: 5580

Date Reported: 11-20-85

Please find attached results for Arsenic, Barium, and Zinc.

Technical Director

Date 11/20/85

Field Identification: MC-7 5'-6'6" 1.1.1 S-2 Matrix: Solid
Laboratory Number: 5580-1

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, recoverable (ug/g)	11-14-85	3050/304	1/2	14
Barium, recoverable (ug/g)	11-15-85	3050/303C	1/2	75
Zinc, recoverable (ug/g)	11-8-85	3050/303A	1/2	100

Field Identification: MC-7 10'-11'6" 8.21.31 S-3 Matrix: Solid
Laboratory Number: 5580-2

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, recoverable (ug/g)	11-14-85	3050/304	1/2	6.2
Barium, recoverable (ug/g)	11-15-85	3050/303C	1/2	63
Zinc, recoverable (ug/g)	11-8-85	3050/303A	1/2	76

Field Identification: MC-10 5'-6'6" 5.7.11 S-2 Matrix: Solid
Laboratory Number: 5580-3

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, recoverable (ug/g)	11-14-85	3050/304	1/2	6.4
Barium, recoverable (ug/g)	11-15-85	3050/303C	1/2	54
Zinc, recoverable (ug/g)	11-8-85	3050/303A	1/2	67

Field Identification: MC-10' Sample(wash) S-3 Matrix: Solid
Laboratory Number: 5580-4

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, recoverable (ug/g)	11-14-85	3050/304	1/2	7.6
Barium, recoverable (ug/g)	11-15-85	3050/303C	1/2	69
Zinc, recoverable (ug/g)	11-8-85	3050/303A	1/2	74

Reference 1: EPA SW 846, 2nd Edition
Reference 2: Standard Methods, 16th Edition

Resource Analysts, Incorporated

APPENDIX D

LOCATION: ATF DAVIDSON, WHITINSVILLE, MA

ENGINEERS: Caswell, Eichler and Hill, Inc.

SAMPLING DATE: 11/13/85

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND/TEMP umhos/cm	°C	pH
M-1	14'	1.5"	1455	7.17'	300	15	5.25
M-2	12'	1.5"	1520	7.74'	242	16	8.15
M-3	10'	1.5"	1710	6.48'	208	15	7.40
M-4	10'	1.5"	1650	7.35'	120	16	6.60
M-5	10'	1.5"	1540	7.02'	358	18	6.30
M-6	10'	1.5"	1620	7.08'	230	15	6.36
M-7	9.5'	1.5"	1606	6.24'	229	15	9.55
M-8	9.8'	1.5"	1640	6.71'	170	15	9.13

Total depths come from the well plans.

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler, and Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF/Davidson

Date Received: 11-14-85 (1030)

Lab Number: 5665

Date Reported: 11-29-85

Please find attached results for Volatile Organic Compounds, Arsenic, Barium, and Zinc.

Russell Prober

Technical Director

Date 11.29.85

page ___ of 3

CHAIN OF CUSTODY DOCUMENTATION

CLIENT ___

ADDRESS ___

JOB NAME/NUMBER ___

PROJECT CONTACT ___

SAMPLING LOCATION ___

SAMPLE COLLECTOR ___

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
M-1 Date Time		○ Solid ◉ Liquid ○ Other	◉ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ◉ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received For Laboratory By:	Date 11/14	Time 1050

Resource Analysts, Incorporated

Resource Analysts, Incorporated

page ____ of ____

CHAIN OF CUSTODY DOCUMENTATION

CLIENT ____

ADDRESS ____

JOB NAME/NUMBER ____

PROJECT CONTACT ____

SAMPLING LOCATION ____

SAMPLE COLLECTOR ____

FIELD IDENTIFICATION (list each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 11/14 Time 1455		○ Solid ◉ Liquid ○ Other	◉ P/ mL ○ G/ mL ○ G/T/ mL	◉ field ○ lab ○ none	1/1	
Date Time 1520		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time 1710		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time 1650		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time 1540		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other ✓	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	**Date**	**Time**	**Received For Laboratory By:**	**Date**	**Time**
			[signature] Clarke	11/14	1038

Resource Analysts, Incorporated

Resource Analysts, Incorporated

page ____ of ____

CHAIN OF CUSTODY DOCUMENTATION

CLIENT _____

ADDRESS _____

JOB NAME/NUMBER _____

PROJECT CONTACT _____

SAMPLING LOCATION _____ SAMPLE COLLECTOR _____

FIELD IDENTIFICATION List each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date / Time 1455		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ mL	○ field ○ lab ◉ none		
Date M-2 Time 1520		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1710		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M 4 Time 1650		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M 5 Time 1540		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M 6 Time 1520		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date 7 Time 1505		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date 5 Time 1450		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
	/ /				
Relinquished By:	Date	Time	Received For Laboratory By:	Date	Time
			Rachel Clarke	11/11	1030

Resource Analysts, Incorporated

Resource Analysts, Incorporated

Field Identification: M-1 Matrix: Water
Laboratory Number: 5665-9

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Field Identification: M-2 Matrix: Water
Laboratory Number: 5665-10

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Field Identification: M-3 Matrix: Water
Laboratory Number: 5665-11

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	0.005

Field Identification: M-4 Matrix: Water
Laboratory Number: 5665-12

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	0.72
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Reference 1: Standard Methods, 16th Edition

Field Identification: M-5 Matrix: Water
Laboratory Number: 5665-13

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	3.1
Zinc, dissolved (mg/L)	11-20-85	303A	1	0.011

Field Identification: M-6 Matrix: Water
Laboratory Number: 5665-14

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	0.73
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Field Identification: M-7 Matrix: Water
Laboratory Number: 5665-15

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Field Identification: M-8 Matrix: Water
Laboratory Number: 5665-16

Parameter	Date analyzed	Method	Ref.m	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	1.4
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Reference 1: Standard Methods, 16th Edition

Lab Number: 5665-1
Sample Designation: M-1
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-2
Sample Designation: M-2
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-2 (Laboratory Duplicate)
Sample Designation: M-2
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-3
Sample Designation: M-3
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	80	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	20	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-4
Sample Designation: M-4
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	Trace	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	Trace	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-5
Sample Designation: M-5
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-6
Sample Designation: M-6
Date analyzed: 11-19-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	180	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	330	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	13	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	27	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-7
Sample Designation: M-7
Date analyzed: 11-19-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	9	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	Trace	5
BENZENE	Trace	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-8
Sample Designation: M-8
Date analyzed: 11-19-85

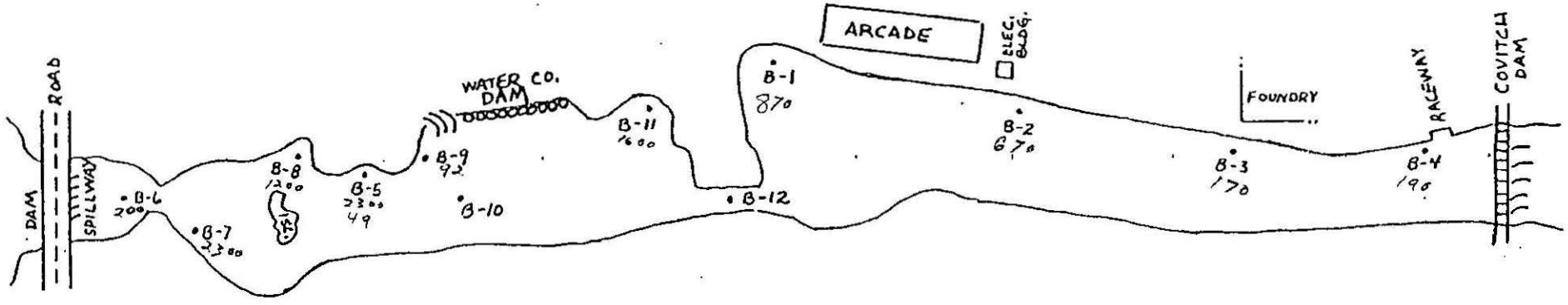
VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	50
VINYL CHLORIDE	380	50
CHLOROETHANE	BDL	25
BROMOMETHANE	BDL	50
METHYLENE CHLORIDE	BDL	25
TRICHLOROFLUOROMETHANE	BDL	25
1,1-DICHLOROETHYLENE	BDL	25
1,1-DICHLOROETHANE	BDL	25
1,2-trans-DICHLOROETHYLENE	1100	25
CHLOROFORM	BDL	25
1,2-DICHLOROETHANE	BDL	25
1,1,1-TRICHLOROETHANE	BDL	25
CARBON TETRACHLORIDE	BDL	25
BROMODICHLOROMETHANE	BDL	25
1,2-DICHLOROPROPANE	BDL	25
1,3-trans-DICHLOROPROPENE	BDL	25
TRICHLOROETHYLENE	Trace	25
BENZENE	BDL	25
1,3-cis-DICHLOROPROPENE	BDL	25
1,1,2-TRICHLOROETHANE	BDL	25
2-CHLOROETHYL VINYL ETHER	BDL	25
DIBROMOCHLOROMETHANE	BDL	25
BROMOFORM	BDL	25
TETRACHLOROETHYLENE	BDL	25
1,1,2,2-TETRACHLOROETHANE	BDL	25
TOLUENE	BDL	25
CHLOROBENZENE	BDL	25
ETHYLBENZENE	BDL	25
ACETONE	BDL	120
CARBON DISULFIDE	BDL	25
THF	BDL	120
MEK	BDL	120
MIBK	BDL	120
STYRENE	BDL	25
XYLENES	BDL	25

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

APPENDIX E



LOCATIONS OF MUMFORD RIVER BOTTOM SEDIMENT SAMPLES (11-13-85)

B-1	BLACK SILTY RIVER BOTTOM SEDIMENTS
B-2	" " " " "
B-3	" " " " "
B-4	" " " " "
B-5A	LT. BRN " " " "
B-5B	DK. BRN " " " "
B-6	SANDY RIVER BOTTOM SEDIMENTS
B-7	BROWN SILTY RIVER BOTTOM SEDIMENTS
B-8	" " " " "
B-9	" " " " "
B-10	SANDY RIVER BOTTOM SEDIMENTS (NO SAMPLE SAVED)
B-11	BROWN SILTY RIVER BOTTOM SEDIMENTS
B-12	ROCKY BOTTOM (NO SAMPLE OBTAINABLE)

NOTE: B-1 THROUGH B-5 TAKEN ON 7-18-85 AND REPORTED IN OUR OCTOBER 1985 ARCADE FACILITY REPORT WERE TAKEN AT THE SAME LOCATIONS AS THOSE SAMPLES TAKEN ON 11-13-85 SHOWN ABOVE

CEH

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler and Hill
P.O. Box 4696
Postsmouth, NH 03801

PO # AFT Davidson

Date Received: 12-9-85 (1425)

Lab Number: 5822

Date Reported: 1-10-86

Please find attached results for Chromium.

Russell K. Frost

Technical Director

Date 1-10-86

Parameter: Chromium, recoverable (ug/g) Matrix: Solid
Method: 3050/303A Reference: 1/2

Laboratory Number	Field Identification	Concentration
5822-1	B-1	870
5822-2	B-2	670
5822-3	B-3	170
5822-4	B-4	190
5822-5	B-5A	2300
5822-6	B-5B	49
5822-7	B-6	200
5822-8	B-7	2300
5822-9	B-8	1200
5822-10	B-9	92
5822-11	B-11	1600

Results expressed on a dry weight basis

Reference 1: EPA SW 846, 2nd Edition
Reference 2: Standard Methods, 16th Edition

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler and Hill
P.O. Box 4696
Portsmouth, NH 03801

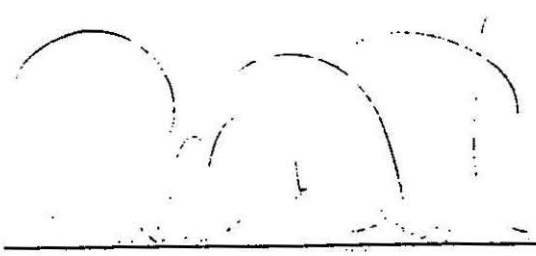
PO # ATF Davidson

Date Received: 11-14-85 (9:30)

Lab Number: 5664

Date Reported: 12-10-85

Please find attached results for EP Toxic Chromium.



Date

Technical Director

CHAIN OF CUSTODY DOCUMENTATION

CLIENT CCII

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT Matt Pichler

SAMPLING LOCATION [illegible] Whitinsville MA

SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION List each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 11/13/88 B-1 Time 1230		● Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ● G/T/ 250 mL	○ field ○ lab ● none	Cool	EP Tox - Chromium
Date B-2 Time 1248		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-3 Time 1300		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-4 Time 1312		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-5A Time 1130		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-5B Time 1130		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-6 Time 1055		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date B-7 Time 1107		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	11/14	AM			
Relinquished By:	Date	Time	Received For Laboratory By: Laurie Clarke	Date 11/14	Time 930

Resource Analysts, Incorporated

page 2 of 2

CHAIN OF CUSTODY DOCUMENTATION

CLIENT CEH

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler

SAMPLING LOCATION ATF Davidson Whidbey Island, WA

SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION (List each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
11/13/85 Date B-8 Time 1122		(●) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL (●) G/T/950 mL	( ) field ( ) lab (●) none	Cool	EP Tox - Chromium
Date B-9 Time 1149		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		
Date B-11 Time 1212		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		
Date B-10 Time		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		No Sample - Sandy River Bottom in center of channel
Date B-12 Time		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		No Sample - Rocky Bottom
Date Time		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		
Date Time		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		
Date Time		( ) Solid ( ) Liquid ( ) Other	( ) P/ mL ( ) G/ mL ( ) G/T/ mL	( ) field ( ) lab ( ) none		

Relinquished By: [signature]	Date 11/14	Time AM	Received By:
Relinquished By:	Date	Time	Received For Laboratory By: [signature]

Date | Time

Date 11/14 | Time 930

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-1

CLIENT Caswell, Eichler, and Hill

SAMPLE DESIGNATION B-1

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE Not required (DRY)

SAMPLE SIZE 75.9g WEIGHT SOLIDS 20.8g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 44.0mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 333.0mL

TIME	PH	ML 0.5N ACID	PH
9:05	6.90	10.0mL	3.72
10:05	4.25	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 73mL

METALS		METHOD	RESULT (MG/L)	ANALYST
ARSENIC		7060		
BARIUM		7080		
CADMIUM		7130		
CHROMIUM	12/6	7190	<0.01	LAC
LEAD		7420		
MERCURY		7470		
SELENIUM		7740		
SILVER		7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-2

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-2

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-4-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 68.87g WEIGHT SOLIDS 21.61g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 41mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 346mL

	TIME	PH	ML 0.5N ACID	PH
12/9	11:30	6.18	10.0mL	3.68
12/5	08:00	9.45	--	--
12/5	4.10	4.51	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 76.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEm
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-3

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-3

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-4-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 75.71mL WEIGHT SOLIDS 38.14g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 32.0mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 610.0mL

	TIME	PH	ML 0.5N ACID	PH
12/4	02:45	7.07	10.0mL	4.15
12/5	08:00	4.66	--	--
12/5	04.12	4.70	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 143.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-4

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-4

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 66.5g WEIGHT SOLIDS 40.0g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 25mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 640mL

TIME	PH	ML 0.5N ACID	PH
10:10	6.23	10.0mL	4.07
10:07	4.28	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 150.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-5

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-5A

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 76.2g WEIGHT SOLIDS 27.6g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 45.5mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 442.0mL

TIME	PH	ML 0.5N ACID	PH
11:20	6.02	10.0mL	3.61
10:17	4.12	--	--
03:00	4.14	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 100.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-6

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-5B

☐ LIQUID ☐ SLURRY ☒ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION would not filter

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 40.0g WEIGHT SOLIDS 40.0g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE -0-

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 640mL

TIME	PH	ML 0.5N ACID	PH
10:30	6.08	10.0mL	4.12
10:08	4.19		
		—	—

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 150.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-7

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-6

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 72.34g WEIGHT SOLIDS 41.5g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 26mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 664mL

	TIME	PH	ML 0.5N ACID	PH
12/4	02:50	6.19	10.0mL	3.65
12/5	08:00	4.04	--	--
12/5	04:15	4.11	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 156.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

5

LAB NUMBER 5664-8

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-7

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 116.4g WEIGHT SOLIDS 28.2g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 82.0mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 451.0mL

TIME	PH	ML 0.5N ACID	PH
12:15	6.12	10.0mL	3.60
10:15	4.20	--	--
03:00	4.20	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 112.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-9

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-8

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 136.5g WEIGHT SOLIDS 34.9g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 98mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 558.0mL

TIME	PH	ML 0.5N ACID	PH
07:50	6.37	10.0mL	3.56
10:10	4.27	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 130.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-10

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-9

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 82.5g WEIGHT SOLIDS 38.1g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 41mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 610mL

TIME	PH	ML 0.5N ACID	PH
02:25	6.44	10.0mL	3.72
10:15	4.09	--	--
03:00	4.08	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 142.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

SUMMARY OF EP TOXICITY TEST

LAB NUMBER 5664-11

CLIENT Caswell, Eichler and Hill

SAMPLE DESIGNATION B-11

☐ LIQUID ☒ SLURRY ☐ PASTE ☐ POWDER ☐ GRANULAR

☐ HOMOGENEOUS ☒ NON-HOMOGENEOUS

DATE SAMPLE RECEIVED 11-14-85 DATE EXTRACTED 12-5-85

SAMPLE PREPERATION filtered to remove liquid

% SOLID RESIDUE not required (DRY)

SAMPLE SIZE 172.0g WEIGHT SOLIDS 26.9g

SOLIDS PREPERATION N/A

VOLUME PRE-EXTRACT FILTRATE 141.0mL

VOLUME OF WATER EXTRACTED ADDED TO SOLIDS 430.0mL

TIME	PH	ML 0.5N ACID	PH
03:55	7.55	10.0mL	3.61
10:14	4.09	--	--
03:00	4.12	--	--

TOTAL VOLUME ACID ADDED 10.0mL

VOLUME WATER ADDED TO FILTERED EXTRACT 98.0mL

METALS	METHOD	RESULT (MG/L)	ANALYST
ARSENIC	7060		
BARIUM	7080		
CADMIUM	7130		
CHROMIUM	7190	<0.01	JEM
LEAD	7420		
MERCURY	7470		
SELENIUM	7740		
SILVER	7760		

ALL CONCENTRATIONS DETERMINED BY THE METHOD OF STANDARD ADDITIONS.

Resource Analysts, Incorporated

ATF/DAVIDSON ARCADE FACILITY SAMPLING REPORT

Prepared for

ATF/Davidson Company
Whitinsville, Massachusetts

Prepared by

Caswell, Eichler & Hill, Inc.
Portsmouth, New Hampshire

October 1986

CEH Caswell, Eichler and Hill, Inc.
GEOLOGY HYDROLOGY GEOPHYSICS
P.O. Box 4696
Portsmouth, NH 03801
TEL. (603) 431-4899

October 9, 1986

White Consolidated Industries
P.O. Box 182056
Columbus, OH 43218

Attn: Mr. Dan Marques

Re: ATF/Davidson Arcade Facility Sampling Report

Dear Dan:

The purpose of this letter is to transmit the combined results of the quarterly sampling at the Arcade Facility during the period 7-18-85 through 8-6-86.

In general, water quality beneath the site either remained about the same, or improved slightly since the first sampling round was conducted 7-18-85. M-8 remains the well exhibiting the highest level of water quality degradation at the site.

The results of all five sampling rounds are reduced and shown in Appendix A. Water quality results for those wells (M-3, M-4, M-6, M-8) that exhibited a consistent presence of any particular volatile organic compound are graphically displayed in Appendix B. Additionally, complete laboratory reports are contained in Appendix C.

Upon review of these data by yourselves and DEQE, please let us know when you would like to schedule a meeting to discuss the results. Should you have any questions or further needs, please call.

Very truly yours,
Caswell, Eichler & Hill, Inc.

Matthew F. Eichler III
Principal

MFE/amk

APPENDIX A

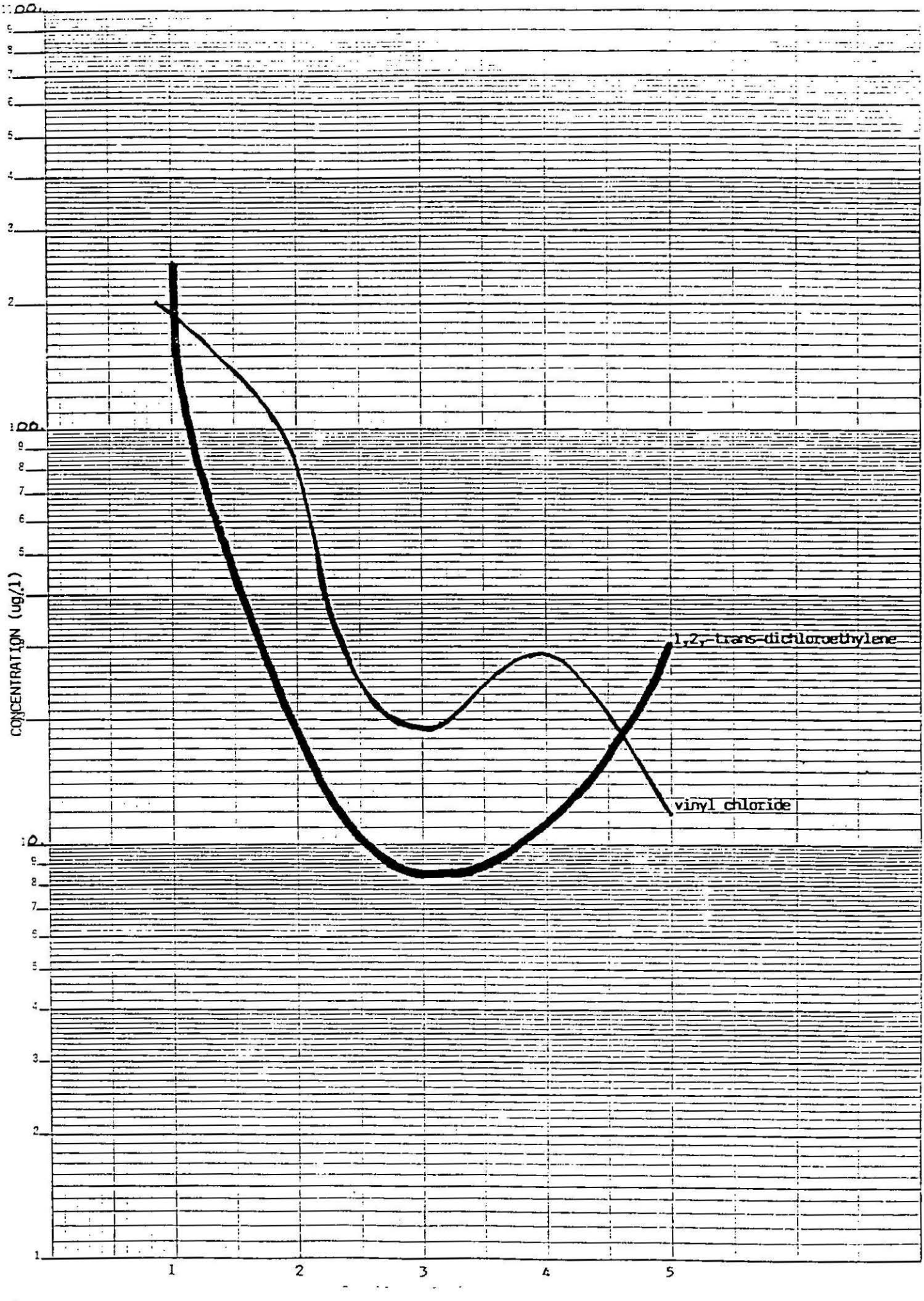
TABULATED DATA

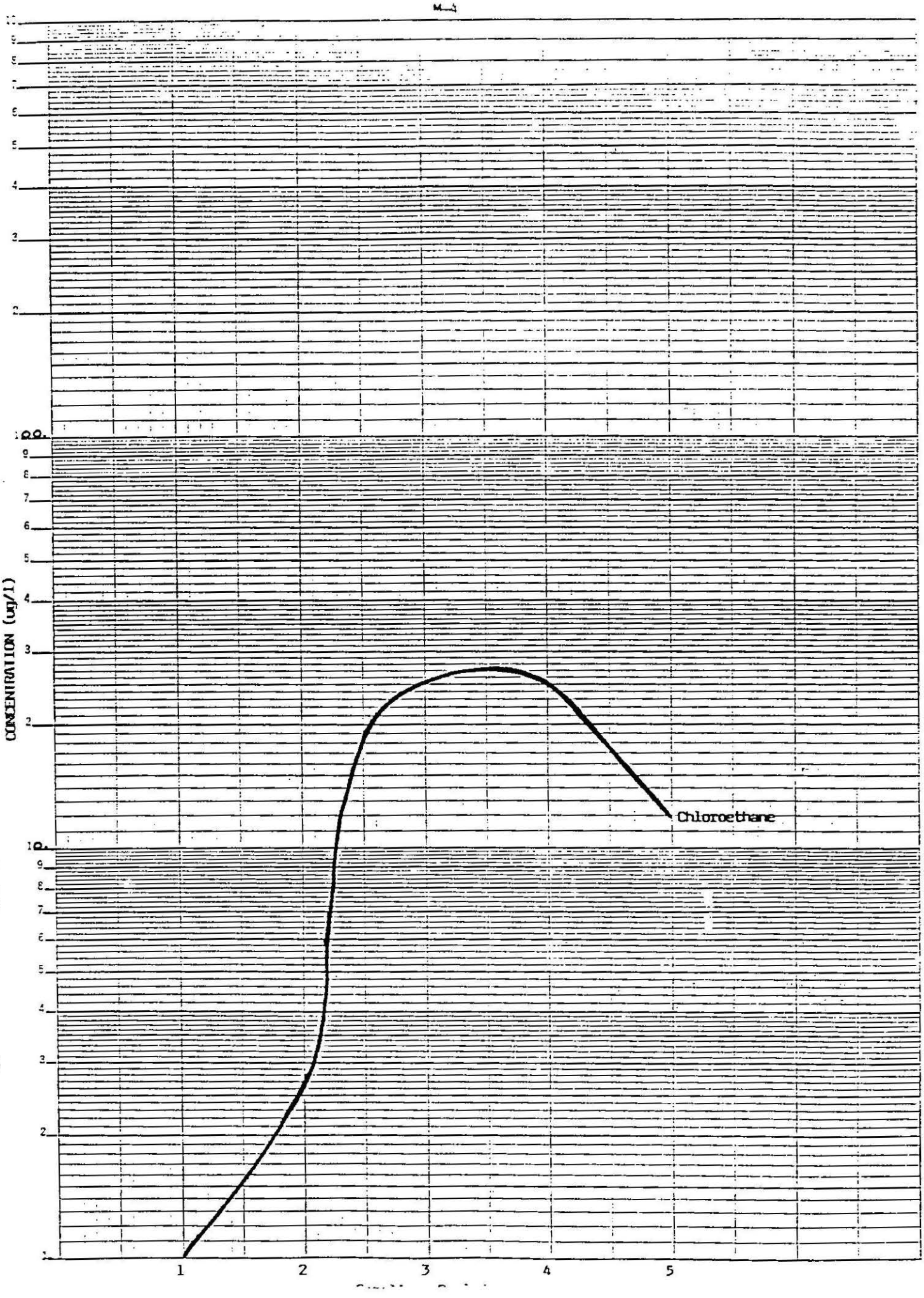
	Benzene	Vinyl Chloride	1,2 - Trans - Dichloroethylene	Trichloroethylene	Tetrachloro-ethylene	1,1,1, Trichloro-ethane	Chloroform	Toluene	Chloroethane	1,1, Dichloro-ethane
M-1										
1. 7-18-85										
2. 11-13-85										
3. 2-10-86	Trace							Trace		
4. 5-13-86	Trace			Trace						
5. 8-6-86										
M-2										
1. "										
2. "										
3. "	Trace									
4. "										
5. "										
M-3										
1. "		190	250	10						
2. "		80	20							
3. "		19	9							
4. "		29	11	Trace						
5. "		12	31			Trace				
M-4										
1. "										
2. "									Trace	Trace
3. "									25	
4. "									25	
5. "									12	

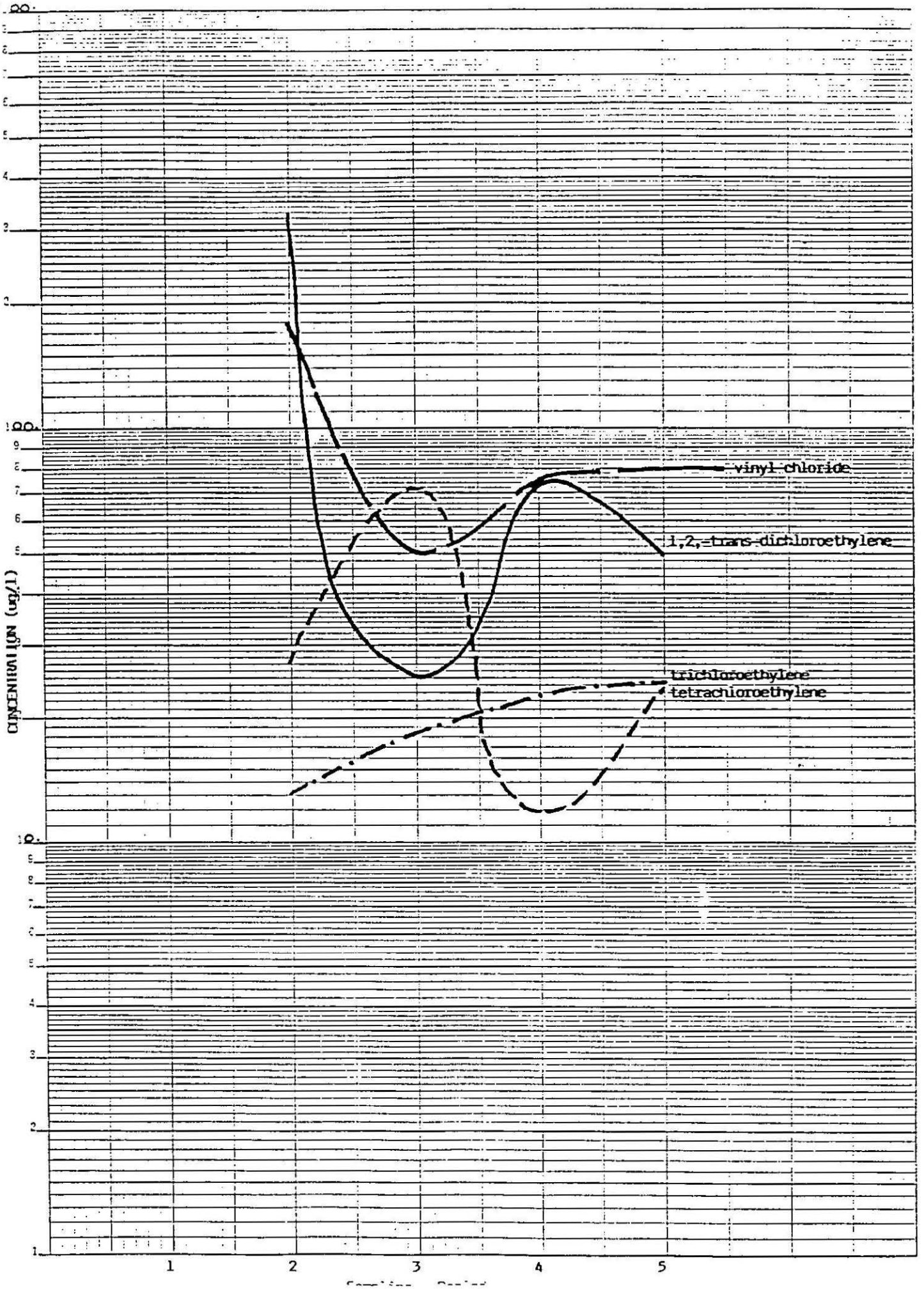
	Benzene	Vinyl Chloride	1,2 - Trans - Dichloroethylene	Trichloroethylene	Tetrachloro-ethylene	1,1,1, Trichloro-ethane	Chloroform	Toluene	Chloroethane	1,1, Dichloro-ethane
M-5										
1. 7-18-85										
2. 11-13-85										
3. 2-10-86										
4. 5-13-86										
5. 8-6-86										
M-6										
1. "			15	30	950					
2. "		180	330	13	27					
3. "		Trace	Trace	Trace	73	Trace				
4. "		76	75		12					
5. "		80	50	Trace	Trace	Trace				
M-7										
1. "										
2. "	Trace			Trace						9
3. "							Trace	6		
4. "										
5. "										
M-8										
1. "		260	610	30	Trace					Trace
2. "		380	1100	Trace						
3. "		Trace	380	Trace	Trace	Trace				
4. "		600	1600	26						
5. "		220	720	15						

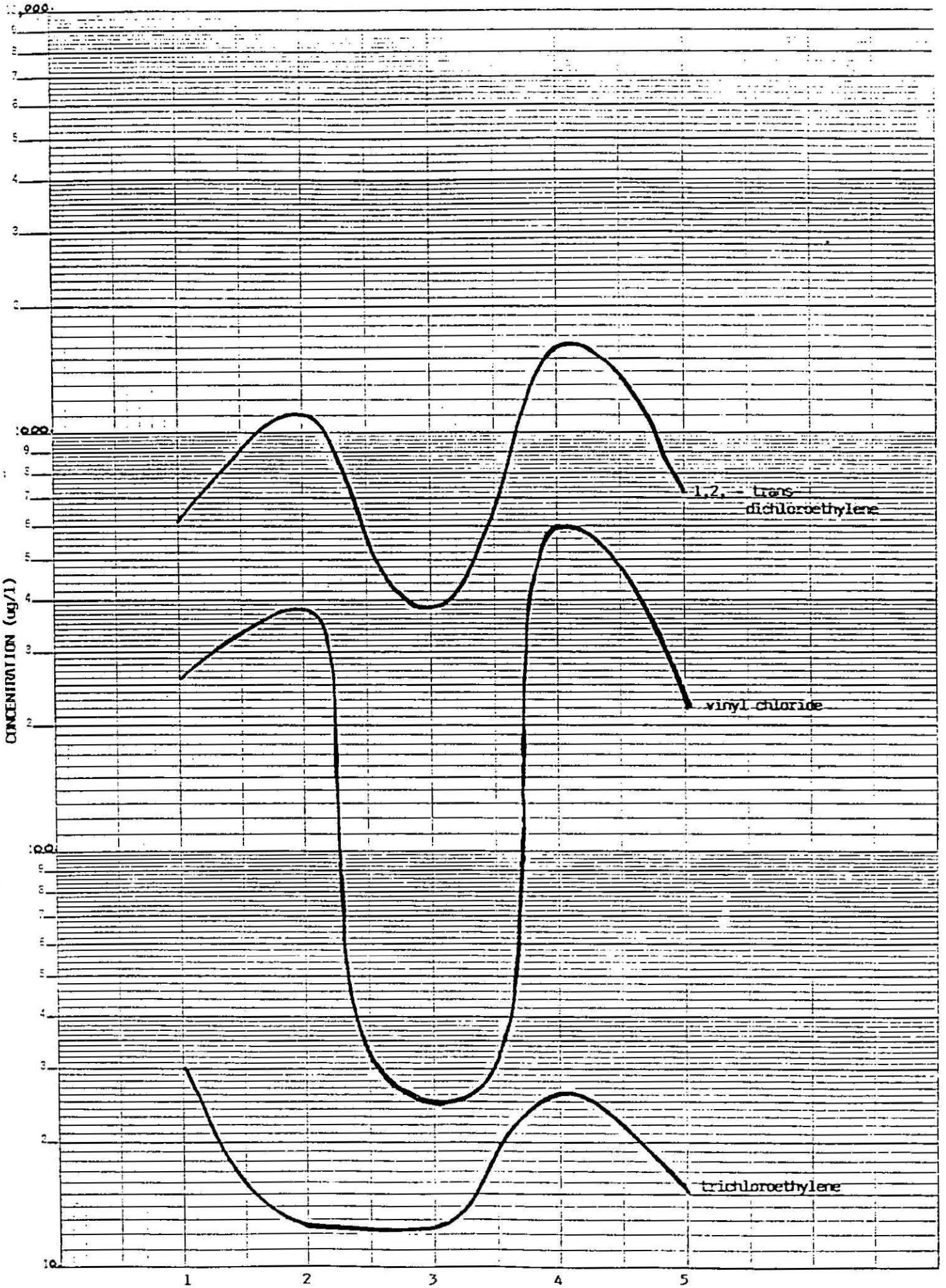
APPENDIX B

GRAPHED DATA


CONCENTRATION (ug/l)
1,2,-trans-dichloroethylene
vinyl chloride
1
2
3
4
5


COMENTRATION (ug/l)
Chloroethane
1
2
3
4
5


vinyl chloride
1,2,-trans-dichloroethylene
trichloroethylene
tetrachloroethylene
CONCENTRATION (ug/l)
1
2
3
4
5


CONCENTRATION (ug/l)
1,2, - trans dichloroethylene
vinyl chloride
trichloroethylene
1
2
3
4
5

APPENDIX C

LABORATORY DATA

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler & Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 7-19-85 (8:10)

Lab Number: 5008

Date Reported: 8-13-85

Please find attached results for Volatile Organic Compounds, Total Cyanide, Oil and Grease, Barium, and Priority Pollutant Metals.

Russell L. Scott

Technical Director

Date 8/13/85

LOCATION: ATF Davidson, Whitinsville, MA

ENGINEERS: Caswell, Eichler, and Hill

SAMPLING DATE: 7/18/85

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND./TEMP. umhos/cm °C		pH
M-1	14'	1.5"	0950	8.31'	425	20.0	7.25
M-2	12'	1.5"	1000	8.75'	300	19.5	8.50
M-3	10'	1.5"	1010	6.90'	260	21.5	6.35
M-4	10'	1.5"	1015	7.68'	225	24.0	8.20
M-5	10'	1.5"	1017	7.35'	365	24.0	7.30
M-6	10'	1.5"	1018	7.47'	235	25.0	6.85
M-7	9.5'	1.5"	1020	6.81'	325	24.0	9.80
M-8	9.8'	1.5"	1023	7.13'	165	22.0	7.30

Total depths come from the well plans.

Proj. No.	Project Name	No. of containers
	ATE Davidson	

Samplers: (Signature) [illegible signature] Matt Eichler [signature]

Sta. No.	Date	Time	Comp.	Grab	Station Location	No. of containers	VOA	EPA 624	TCAP	Priority Pollutant	pH	[illegible]	Oil + Grease	Remarks: Static level	TD	Dep
M-1	7/18/85	1415		✓		3	✓	✓	✓	[illegible]	1.5			8.31'	14'	[illegible]
M-2		1422		✓			✓	✓	✓	[illegible]	0.9			8.75'	12'	[illegible]
M-3		1520		✓			✓	-	[illegible]	[illegible]	0.8			6.90'	10'	[illegible]
M-4		1300		✓			✓	✓	✓	[illegible]	0.6			7.68'	10'	[illegible]
M-5		1330		✓			✓	✓	✓	[illegible]	0.7			7.35'	10'	[illegible]
M-6		1115		✓			✓	✓	✓	[illegible]	0.7			7.17'	10'	[illegible]
M-7		1110		✓			✓	✓	✓	[illegible]	0.7			6.81'	9.5'	[illegible]
M-8		1055		✓			✓	✓	✓	[illegible]	0.7			7.13'	9.8'	[illegible]
M-3		1510		✓									✓	Oil + Grease [illegible]		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	7/18 1555				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks
		[signature]	7/18/85 2000	

Caswell, Eichler, & Hill
Laboratory Number 5008
8-13-85

Field Identification: M-1 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-9	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-17	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-17	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-17	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-17	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-17	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-17	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-17	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-17	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-17	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-17	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-17	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-17	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-17	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-17	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.028

Field Identification: M-2 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-10	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-18	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-18	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-18	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-18	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-18	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-18	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-18	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-18	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-18	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-18	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-18	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-18	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-18	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-18	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.045

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Resource Analysts, Incorporated

Field Identification: M-3 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-11	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-19	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-19	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-19	Barium, recoverable (mg/L)	8-8-85	303A	2	0.34
5008-19	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-19	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-19	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-19	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-19	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-19	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-19	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-19	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-19	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-19	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-19	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.022
5008-29	Oil and Grease (mg/L)	7-25-85	413.2	1	<5

Field Identification: M-4 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-12	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-20	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-20	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-20	Barium, recoverable (mg/L)	8-8-85	303A	2	1.0
5008-20	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-20	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-20	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-20	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-20	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-20	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-20	Lead, recoverable (mg/L)	8-7-85	303A	2	<0. 03
5008-20	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-20	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-20	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-20	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.021

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Field Identification: M-5 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-13	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-21	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-21	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-21	Barium, recoverable (mg/L)	8-8-85	303A	2	2.9
5008-21	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-21	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-21	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-21	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-21	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-21	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-21	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-21	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-21	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-21	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-21	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.016

Field Identification: M-6 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-14	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-22	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-22	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-22	Barium, recoverable (mg/L)	8-8-85	303A	2	0.91
5008-22	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-22	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-22	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-22	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-22	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-22	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-22	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-22	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-22	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-22	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-22	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.020

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Field Identification: M-7 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-15	Total Cyanide (mg/L)	8-2-85	335.2	1	<0.01
5008-23	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-23	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-23	Barium, recoverable (mg/L)	8-8-85	303A	2	<0.2
5008-23	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-23	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-23	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-23	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-23	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-23	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-23	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-23	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-23	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-23	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.016

Field Identification: M-8 Matrix: Liquid

Lab Number	Parameter	Date analyzed	Method	Ref.	Concentration
5008-16	Total Cyanide (mg/L)	8-2-85	335.2	1	0.03
5008-24	Silver, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-24	Arsenic, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-24	Barium, recoverable (mg/L)	8-8-85	303A	2	1.2
5008-24	Beryllium, recoverable (mg/L)	7-25-85	303C	2	<0.002
5008-24	Cadmium, recoverable (mg/L)	8-7-85	303A	2	<0.003
5008-24	Chromium, recoverable (mg/L)	8-9-85	303A	2	<0.005
5008-24	Copper, recoverable (mg/L)	8-7-85	303A	2	<0.005
5008-24	Mercury, recoverable (mg/L)	7-23-85	7641	3	<0.0006
5008-24	Nickel, recoverable (mg/L)	8-9-85	303A	2	<0.02
5008-24	Lead, recoverable (mg/L)	8-7-85	303A	2	<0.03
5008-24	Antimony, recoverable (mg/L)	8-12-85	303A	2	<0.8
5008-24	Selenium, recoverable (mg/L)	7-25-85	304	2	<0.01
5008-24	Thallium, recoverable (mg/L)	8-12-85	303A	2	<0.6
5008-24	Zinc, recoverable (mg/L)	8-7-85	303A	2	0.010

Reference:
1. EPA 600/4-79-020
2. Standard Methods, 16th Edition
3. EPA SW 846, 2nd Edition

Lab Number: 5008-1
Sample Designation: M-1
Date analyzed: 7-24-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-2
Sample Designation: M-2
Date analyzed: 7-24-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-3
Sample Designation: M-3
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	190	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	250	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	10	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-3 (Laboratory Duplicate)
Sample Designation: M-3
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	210	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	250	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	10	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-4
Sample Designation: M-4
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-5
Sample Designation: M-5
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-6
Sample Designation: M-6
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	24
VINYL CHLORIDE	BDL	24
CHLOROETHANE	BDL	12
BROMOMETHANE	BDL	24
METHYLENE CHLORIDE	BDL	12
TRICHLOROFLUOROMETHANE	BDL	12
1,1-DICHLOROETHYLENE	BDL	12
1,1-DICHLOROETHANE	BDL	12
1,2-trans-DICHLOROETHYLENE	15	12
CHLOROFORM	BDL	12
1,2-DICHLOROETHANE	BDL	12
1,1,1-TRICHLOROETHANE	BDL	12
CARBON TETRACHLORIDE	BDL	12
BROMODICHLOROMETHANE	BDL	12
1,2-DICHLOROPROPANE	BDL	12
1,3-trans-DICHLOROPROPENE	BDL	12
TRICHLOROETHYLENE	30	12
BENZENE	BDL	12
1,3-cis-DICHLOROPROPENE	BDL	12
1,1,2-TRICHLOROETHANE	BDL	12
2-CHLOROETHYL VINYL ETHER	BDL	12
DIBROMOCHLOROMETHANE	BDL	12
BROMOFORM	BDL	12
TETRACHLOROETHYLENE	950	12
1,1,2,2-TETRACHLOROETHANE	BDL	12
TOLUENE	BDL	12
CHLOROBENZENE	BDL	12
ETHYLBENZENE	BDL	12
ACETONE	BDL	60
CARBON DISULFIDE	BDL	12
THF	BDL	60
MEK	BDL	60
MIBK	BDL	60
STYRENE	BDL	12
XYLENES	BDL	12

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-7
Sample Designation: M-7
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Lab Number: 5008-8
Sample Designation: M-8
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	14
VINYL CHLORIDE	260	14
CHLOROETHANE	BDL	7
BROMOMETHANE	BDL	14
METHYLENE CHLORIDE	BDL	7
TRICHLOROFLUOROMETHANE	BDL	7
1,1-DICHLOROETHYLENE	BDL	7
1,1-DICHLOROETHANE	Trace	7
1,2-trans-DICHLOROETHYLENE	610	7
CHLOROFORM	BDL	7
1,2-DICHLOROETHANE	BDL	7
1,1,1-TRICHLOROETHANE	BDL	7
CARBON TETRACHLORIDE	BDL	7
BROMODICHLOROMETHANE	BDL	7
1,2-DICHLOROPROPANE	BDL	7
1,3-trans-DICHLOROPROPENE	BDL	7
TRICHLOROETHYLENE	30	7
BENZENE	BDL	7
1,3-cis-DICHLOROPROPENE	BDL	7
1,1,2-TRICHLOROETHANE	BDL	7
2-CHLOROETHYL VINYL ETHER	BDL	7
DIBROMOCHLOROMETHANE	BDL	7
BROMOFORM	BDL	7
TETRACHLOROETHYLENE	Trace	7
1,1,2,2-TETRACHLOROETHANE	BDL	7
TOLUENE	BDL	7
CHLOROBENZENE	BDL	7
ETHYLBENZENE	BDL	7
ACETONE	BDL	35
CARBON DISULFIDE	BDL	7
THF	BDL	35
MEK	BDL	35
MIBK	BDL	35
STYRENE	BDL	7
XYLENES	BDL	7

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5008-30
Sample Designation: Trip Blank
Date analyzed: 7-26-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-79-020 METHOD 624

ENVIRONMENTAL FIELD SERVICES, INC.
Box 4778
Hampton, N.H. 03842
(603) 926-8142

LOCATION: ATF DAVIDSON, WHITINSVILLE, MA

ENGINEERS: Caswell, Eichler and Hill, Inc.

SAMPLING DATE: 11/13/85

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND/TEMP umhos/cm	°C	pH
M-1	14'	1.5"	1455	7.17'	300	15	5.25
M-2	12'	1.5"	1520	7.74'	242	16	8.15
M-3	10'	1.5"	1710	6.48'	208	15	7.40
M-4	10'	1.5"	1650	7.35'	120	16	6.60
M-5	10'	1.5"	1540	7.02'	358	18	6.30
M-6	10'	1.5"	1620	7.08'	230	15	6.36
M-7	9.5'	1.5"	1606	6.24'	229	15	9.55
M-8	9.8'	1.5"	1640	6.71'	170	15	9.13

Total depths come from the well plans.

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler, and Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF/Davidson

Date Received: 11-14-85 (1030)

Lab Number: 5665

Date Reported: 11-29-85

Please find attached results for Volatile Organic Compounds, Arsenic, Barium, and Zinc.

Russell Taylor

Date 11.29.85

Technical Director

CHAIN OF CUSTODY DOCUMENTATION

CLIENT [illegible]

ADDRESS

PROJECT CONTACT [illegible]

JOB NAME/NUMBER

SAMPLING LOCATION [illegible]

SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION List each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date [illegible] M-1 Time [illegible]		Solid / Liquid (marked) / Other	P/ [illegible] mL (marked) / G/ mL / G/T/ mL	field / lab / none (marked)	[illegible]	[illegible] 15 [illegible]
Date M-2 Time [illegible]		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible]
Date M-3 Time		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		7.45
Date [illegible] Time [illegible]		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible]
Date Time [illegible]		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible] 8
Date [illegible] Time [illegible]		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible]
Date [illegible] Time		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible]
Date Time		Solid / Liquid / Other	P/ mL / G/ mL / G/T/ mL	field / lab / none		[illegible]

Relinquished By:	Date	Time	Received By:	Date	Time
[illegible signature]	[illegible]	[illegible]			
Relinquished By:	Date	Time	Received For Laboratory By: Laura Clarke	11/14	10[illegible]

Resource Analysts, Incorporated

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT C.C.I

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT

SAMPLING LOCATION

SAMPLE COLLECTOR

FIELD IDENTIFICATION List each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
11/5/14 Date M-1 Time 1455		○ Solid ◉ Liquid ○ Other	○ P/ 250 mL ○ G/ mL ○ G/T/ mL	◉ field ○ lab ○ none	HNO3 to pH<2	Dissolved Fe & Mn
Date M-2 Time 1520		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1710		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-4 Time 1650		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-5 Time 1540		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	**Date**	**Time**	**Received for Laboratory By:**	**Date**	**Time**
			Laurie Clarke	11/14	10:2

Resource Analysts, Incorporated

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT [illegible]

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT [illegible]

SAMPLING LOCATION [illegible] MA

SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 11/7/[illegible] M-1 Time 1455		Solid / Liquid (marked) / Other	P/ mL; G/ mL; G/T/ 40 mL (marked)	field / lab / none (marked)	[illegible]	[illegible] EPA [illegible] plus 10 [illegible]
Date M-2 Time 1520		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M-3 Time 1710		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M 4 Time 16[illegible]		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M-5 Time [illegible]		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M-6 Time [illegible]		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M 7 Time [illegible]		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ mL	field / lab / none		
Date M-8 Time [illegible]		Solid / Liquid / Other	P/ mL; G/ mL; G/T/ [illegible] mL	field / lab / none		

Relinquished By:	Date	Time	Received By:	Date	Time
[illegible signature]	[illegible]				

Relinquished By:	Date	Time	Received For Laboratory By:	Date	Time
			Laura Clarke	11/[illegible]	10:3[illegible]

eld Identification: M-1 Matrix: Water
Laboratory Number: 5665-9

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

eld Identification: M-2 Matrix: Water
aboratory Number: 5665-10

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

eld Identification: M-3 Matrix: Water
aboratory Number: 5665-11

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	0.005

ield Identification: M-4 Matrix: Water
aboratory Number: 5665-12

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	0.72
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

eference 1: Standard Methods, 16th Edition

ld Identification: M-5 Matrix: Water
boratory Number: 5665-13

arameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
arium, dissolved (mg/L)	11-15-85	303C	1	3.1
inc, dissolved (mg/L)	11-20-85	303A	1	0.011

ld Identification: M-6 Matrix: Water
boratory Number: 5665-14

arameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
arium, dissolved (mg/L)	11-15-85	303C	1	0.73
inc, dissolved (mg/L)	11-20-85	303A	1	<0.005

eld Identification: M-7 Matrix: Water
boratory Number: 5665-15

Parameter	Date analyzed	Method	Ref.	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	<0.2
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Field Identification: M-8 Matrix: Water
Laboratory Number: 5665-16

Parameter	Date analyzed	Method	Ref.m	Concentration
Arsenic, dissolved (mg/L)	11-15-85	303A	1	<0.01
Barium, dissolved (mg/L)	11-15-85	303C	1	1.4
Zinc, dissolved (mg/L)	11-20-85	303A	1	<0.005

Reference 1: Standard Methods, 16th Edition

Lab Number: 5665-1
Sample Designation: M-1
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-2
Sample Designation: M-2
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-2 (Laboratory Duplicate)
Sample Designation: M-2
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-3
Sample Designation: M-3
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	80	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	20	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-4
Sample Designation: M-4
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	Trace	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	Trace	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-5
Sample Designation: M-5
Date analyzed: 11-16-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 5665-6
Sample Designation: M-6
Date analyzed: 11-19-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	180	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	330	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	13	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	27	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-7
Sample Designation: M-7
Date analyzed: 11-19-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
TRICHLOROFLUOROMETHANE	BDL	5
1,1-DICHLOROETHYLENE	9	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	Trace	5
BENZENE	Trace	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 5665-8
Sample Designation: M-8
Date analyzed: 11-19-85

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	50
VINYL CHLORIDE	380	50
CHLOROETHANE	BDL	25
BROMOMETHANE	BDL	50
METHYLENE CHLORIDE	BDL	25
TRICHLOROFLUOROMETHANE	BDL	25
1,1-DICHLOROETHYLENE	BDL	25
1,1-DICHLOROETHANE	BDL	25
1,2-trans-DICHLOROETHYLENE	1100	25
CHLOROFORM	BDL	25
1,2-DICHLOROETHANE	BDL	25
1,1,1-TRICHLOROETHANE	BDL	25
CARBON TETRACHLORIDE	BDL	25
BROMODICHLOROMETHANE	BDL	25
1,2-DICHLOROPROPANE	BDL	25
1,3-trans-DICHLOROPROPENE	BDL	25
TRICHLOROETHYLENE	Trace	25
BENZENE	BDL	25
1,3-cis-DICHLOROPROPENE	BDL	25
1,1,2-TRICHLOROETHANE	BDL	25
2-CHLOROETHYL VINYL ETHER	BDL	25
DIBROMOCHLOROMETHANE	BDL	25
BROMOFORM	BDL	25
TETRACHLOROETHYLENE	BDL	25
1,1,2,2-TETRACHLOROETHANE	BDL	25
TOLUENE	BDL	25
CHLOROBENZENE	BDL	25
ETHYLBENZENE	BDL	25
ACETONE	BDL	120
CARBON DISULFIDE	BDL	25
THF	BDL	120
MEK	BDL	120
MIBK	BDL	120
STYRENE	BDL	25
XYLENES	BDL	25

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

ENVIRONMENTAL FIELD SERVICES INC.
Box 4778
Hampton, N.H. 03842
(603) 926-8142

LOCATION: ATF Davidson, Whitinsville, MA

ENGINEERS: Caswell, Eichler and Hill

SAMPLING DATE: 2/10/86

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND/TEMP umhos/cm	°C	pH
M-1	14'	1.5"	1235	8.21'	280	10.0	6.8
M-2	12'	1.5"	1247	8.52'	220	10.1	8.7
M-3	10'	1.5"	1407	6.79'	161	10.2	7.0
M-4	10'	1.5"	1315	7.81'	104	10.3	7.0
M-5	10'	1.5"	1348	7.33'	290	10.1	6.8
M-6	10'	1.5"	1421	7.62'	218	10.0	6.9
M-7	9.5'	1.5"	1426	6.94'	170	10.2	9.7
M-8	9.8'	1.5"	1458	7.08'	150	10.3	8.1

Total depths come from the well plans.

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matthew Eichler
Caswell, Eichler and Hill
PO Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 2-11-86 (9:35)

Lab Number: 6205

Date Reported: 2-26-86

Please find attached results for Volatile Organic Compounds and Barium.

Russell Frost

Date 2-26-86

Technical Director

page 1 of 3

CHAIN OF CUSTODY DOCUMENTATION

CLIENT C E H

ADDRESS P O Box 4696
Portsmouth, NH 03801

PROJECT CONTACT Matt Eicher

JOB NAME/NUMBER

SAMPLING LOCATION ATF Davidson, Whitinsville, MA

SAMPLE COLLECTOR A. Abrantes R. McCampbell

FIELD IDENTIFICATION (List each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
2/10/86 Date M-1 Time 12.35		○ Solid ● Liquid ○ Other	○ P/ mL ○ G/ mL ● G/T/40 mL	○ field ○ lab ● none	Cool	VOA - EPA 624
Date M-2 Time 12.47		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1515		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-4 Time 1315		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-5 Time 1348		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-6 Time 1421		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-7 Time 1426		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
2/6 M-8 Time 1458		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
	2/11	0935			
Relinquished By:	Date	Time	Received For Laboratory By:	Date	Time
				2/11/86	0935

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT C EH

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler

SAMPLING LOCATION ATT Davidson, Whitinsville MA

SAMPLE COLLECTOR [illegible], R McCampbell

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 2/10/86 M-1 Time 1235		○ Solid ● Liquid ○ Other	● P/ 125 mL ○ G/ mL ○ G/T/ mL	● field ○ lab ○ none	HNO3 + cool	Dissolved Barium
Date M-2 Time 1247		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1515		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-4 Time 1315		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-5 Time 1348		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-6 Time 1421		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-7 Time 1426		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-8 Time 1458		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	2/11	0935			
Relinquished By:	Date	Time	Received For Laboratory By: David M. Pease, *Resource Analysts, Incorporated*	2/11/86	0935

CHAIN OF CUSTODY DOCUMENTATION

CLIENT C EH

ADDRESS

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler

SAMPLING LOCATION

SAMPLE COLLECTOR [illegible signature]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
2/10/86 Trip Blank Date Time		○ Solid ● Liquid ○ Other	○ P/ mL ○ G/ mL ● G/T/ 40 mL	○ field ○ lab ● none	cool	VOA - EPA 624
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	2/11	0905			
Relinquished By:	Date	Time	Received For Laboratory By: David M. Pease Resource Analysts, Incorporated	2/11/86	0955

Parameter: Barium, dissolved (mg/L) Matrix: Water
Method: 303C Reference: 1

Laboratory Number	Field Identification	Concentration
6205-10	M-1	<0.3
6205-11	M-2	<0.3
6205-12	M-3	<0.3
6205-13	M-4	<0.3
6205-14	M-5	3.0
6205-15	M-6	1.1
6205-16	M-7	<0.3
6205-17	M-8	1.2

Reference 1: Standard Methods, 16th Edition

Lab Number: 6205-1
Sample Designation: M-1
Date analyzed: 2-13-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	TRACE	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	TRACE	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 6205-1 (Laboratory Duplicate)
Sample Designation: M-1
Date analyzed: 2-13-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	12	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6205-2
Sample Designation: M-2
Date analyzed: 2-13-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	TRACE	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

MATRIX SPIKE DUPLICATE RECOVERY

LAB NUMBER 6205-2 DATE 2-13-86 SAMPLE DESIGNATION M-2

COMPOUND	CONCENTRATION SPIKE ADDED (u/g)	SAMPLE RESULT	CONCENTRATION MATRIX SPIKE	% RECOVERY	CONCENTRATION MATRIX DUP. SPIKE	% RECOVERY	RELATIVE % DIFFERENCE
1,1 DICHLOROETHYLENE	63	0	59	94	60	95	1.0
TRICHLOROETHYLENE	51	0	46	90	48	94	4.3
BENZENE	54	0	41	76	45	83	8.8
TOLUENE	52	0	47	90	67	128	35
CHLOROBENZENE	52	0	49	94	53	102	8.2

Resource Analysts, Incorporated

METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6205-3
Sample Designation: M-3
Date analyzed: 2-21-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	19	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	9	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 6205-4
Sample Designation: M-4
Date analyzed: 2-13-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	25	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 6205-5
Sample Designation: M-5
Date analyzed: 2-14-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6205-5 (Laboratory Duplicate)
Sample Designation: M-5
Date analyzed: 2-14-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6205-6
Sample Designation: M-6
Date analyzed: 2-17-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	50
VINYL CHLORIDE	TRACE	50
CHLOROETHANE	BDL	25
BROMOMETHANE	BDL	50
METHYLENE CHLORIDE	BDL	25
1,1-DICHLOROETHYLENE	BDL	25
1,1-DICHLOROETHANE	BDL	25
1,2-trans-DICHLOROETHYLENE	TRACE	25
CHLOROFORM	BDL	25
1,2-DICHLOROETHANE	BDL	25
1,1,1-TRICHLOROETHANE	TRACE	25
CARBON TETRACHLORIDE	BDL	25
VINYL ACETATE	BDL	50
BROMODICHLOROMETHANE	BDL	25
1,2-DICHLOROPROPANE	BDL	25
1,3-trans-DICHLOROPROPENE	BDL	25
TRICHLOROETHYLENE	TRACE	25
BENZENE	BDL	25
1,3-cis-DICHLOROPROPENE	BDL	25
1,1,2-TRICHLOROETHANE	BDL	25
2-CHLOROETHYL VINYL ETHER	BDL	25
DIBROMOCHLOROMETHANE	BDL	25
BROMOFORM	BDL	25
TETRACHLOROETHYLENE	73	25
1,1,2,2-TETRACHLOROETHANE	BDL	25
TOLUENE	BDL	25
CHLOROBENZENE	BDL	25
ETHYLBENZENE	BDL	25
ACETONE	BDL	125
CARBON DISULFIDE	BDL	25
THF	BDL	125
MEK	BDL	125
MIBK	BDL	125
2-HEXANONE	BDL	125
STYRENE	BDL	25
XYLENES	BDL	25

"Trace" denotes probable presence below listed detection limit.
Detection limit raised by the presence of non-listed compounds.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 6205-7
Sample Designation: M-7
Date analyzed: 2-14-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	TRACE	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	6	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6205-8
Sample Designation: M-8
Date analyzed: 2-17-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	50
VINYL CHLORIDE	TRACE	50
CHLOROETHANE	BDL	25
BROMOMETHANE	BDL	50
METHYLENE CHLORIDE	BDL	25
1,1-DICHLOROETHYLENE	BDL	25
1,1-DICHLOROETHANE	BDL	25
1,2-trans-DICHLOROETHYLENE	380	25
CHLOROFORM	BDL	25
1,2-DICHLOROETHANE	BDL	25
1,1,1-TRICHLOROETHANE	TRACE	25
CARBON TETRACHLORIDE	BDL	25
VINYL ACETATE	BDL	50
BROMODICHLOROMETHANE	BDL	25
1,2-DICHLOROPROPANE	BDL	25
1,3-trans-DICHLOROPROPENE	BDL	25
TRICHLOROETHYLENE	TRACE	25
BENZENE	BDL	25
1,3-cis-DICHLOROPROPENE	BDL	25
1,1,2-TRICHLOROETHANE	BDL	25
2-CHLOROETHYL VINYL ETHER	BDL	25
DIBROMOCHLOROMETHANE	BDL	25
BROMOFORM	BDL	25
TETRACHLOROETHYLENE	TRACE	25
1,1,2,2-TETRACHLOROETHANE	BDL	25
TOLUENE	BDL	25
CHLOROBENZENE	BDL	25
ETHYLBENZENE	BDL	25
ACETONE	BDL	125
CARBON DISULFIDE	BDL	25
THF	BDL	125
MEK	BDL	125
MIBK	BDL	125
2-HEXANONE	BDL	125
STYRENE	BDL	25
XYLENES	BDL	25

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Lab Number: 6205-9
Sample Designation: Trip Blank
Date analyzed: 2-17-86

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
VINYL ACETATE	BDL	10
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
CEH
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 5/14/86 (0900)

Lab Number: 6830

Date Reported: May 30, 1986

Attached please find test results for Volatile Organic Compounds, Barium, and Specific Conductance.

Russell D. Scalera

Date 5/30/86

Technical Director

LOCATION: ATF Davidson, Whitinsville, MA

ENGINEERS: Caswell, Eichler and Hill

SAMPLING DATE: 5/13/86

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND/TEMP * umhos/cm	°C	pH
M-1	14'	1.5"	1345	8.38'	305	25.0	7.9
M-2	12'	1.5"	1356	8.83'	270	25.0	9.0
M-3	10'	1.5"	1437	7.00'	150	25.0	6.9
M-4	10'	1.5"	1431	7.71'	235	25.0	7.4
M-5	10'	1.5"	1425	7.42'	370	25.0	7.2
M-6	10'	1.5"	1550	7.67'	195	25.0	7.6
M-7	9.5'	1.5"	1555	7.12'	190	25.0	10.6
M-8	9.8'	1.5"	1615	7.15'	180	25.0	9.1

Total depths come from the well plans.

* The conductivity data was provided by Resource Analysts, Inc. Samples were brought to 25.0 °C.

page 1 of 4

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: CEH
ADDRESS: PO Box 4696
Portsmouth, NH 03801

PROJECT CONTACT: Matt Eichler
SAMPLING LOCATION: ATF Davidson, Whitinsville, MA
JOB NAME/NUMBER: 6836
SAMPLE COLLECTOR: [signature]

FIELD IDENTIFICATION (list each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
5/13/96 Date M-1 Time 1359		○ Solid ● Liquid ○ Other	○ P/ mL ○ G/ mL ● G/T/ 40 mL	○ field ○ lab ● none	cool	VOA - EPA 624
Date M-2 Time 1412		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1544		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-4 Time 1523		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-5 Time 1505		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-6 Time 1723		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-7 Time 1734		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-8 Time 1810		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	5/14	0845			
Relinquished By:	Date	Time	Received for Laboratory By:	Date	Time
			Z. Woods	5/14	0845

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: CEH

ADDRESS:

JOB NAME/NUMBER:

PROJECT CONTACT: Mitch Eichler

SAMPLING LOCATION: ATF Davidson, Whitinsville, MA

SAMPLE COLLECTOR: M Davidson

FIELD IDENTIFICATION (List each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 5/13/86 M-1 Time 1359		○ Solid ● Liquid ○ Other	● P/ 125 mL ○ G/ mL ○ G/T/ mL	● field ○ lab ○ none	HNO3 + ice	Dissolved Barium
Date M-2 Time 1412		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-3 Time 1544		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-4 Time 1523		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-5 Time 1505		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-6 Time 1723		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-7 Time 0734		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date M-8 Time 1810		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
M Davidson	5/14	0845			
Relinquished By:	Date	Time	Received For Laboratory By: E Woods	Date 5/14	Time 0845

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: CEH

ADDRESS:

PROJECT CONTACT: Matt Eichler

JOB NAME/NUMBER:

SAMPLING LOCATION: ATE Davidson, Whitinsville, MA

SAMPLE COLLECTOR: [illegible]

FIELD IDENTIFICATION (list each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 5/12/86 Trip Blank Time 1400		Liquid	G/T/ 40 mL	none	cool	VOA – EPA 624
Date 5/13/86 M-1 Time 1359			P/ 250 mL	none		spec cond
Date M-2 Time 1412						
Date M-3 Time 1544						
Date M-4 Time 1503						
Date M-5 Time 1525						
Date M-6 Time 1733						
Date M-7 Time 1734						

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	5/14	0845			
Relinquished By:	Date	Time	Received For Laboratory By: Z Woods	5/14	0845

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: CEH

ADDRESS:

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Eichler

SAMPLING LOCATION: A-T-F Dairies, Whitesville, MA SAMPLE COLLECTOR:

FIELD IDENTIFICATION (list each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 5/13/86 M-8 Time 1810		(Solid) (Liquid) Other	(P/ 250 mL) G/ mL G/T/ mL	field lab (none)	cool	Spec Cond
Date Time		Solid (Liquid) Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid (Liquid) Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid Liquid Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid Liquid Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid Liquid Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid Liquid Other	P/ mL G/ mL G/T/ mL	field lab none		
Date Time		Solid Liquid Other	P/ mL G/ mL G/T/ mL	field lab none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	5/14	0845			
Relinquished By:	Date	Time	Received For Laboratory By: Z. Woods	Date 5/14	Time 0845

Resource Analysts, Incorporated

Parameter: Barium, dissolved (mg/L) Matrix: Water
Method, Reference: 303C, Standard Methods, 16th Edition
Date Analyzed: 5/20/86

Laboratory Number	Field Identification	Concentration
6830-10	M-1	<0.3
6830-11	M-2	<0.3
6830-12	M-3	<0.3
6830-13	M-4	0.81
6830-14	M-5	3.6
6830-15	M-6	0.96
6830-16	M-7	<0.3
6830-17	M-8	1.3

Parameter: Specific Conductance (umho/cm) Matrix: Water
Method, Reference: 205, Standard Methods, 16th Edition
Date Analyzed: 5/20/86

Laboratory Number	Field Identification	Concentration
6830-18	M-1	305
6830-19	M-2	270
6830-20	M-3	150
6830-21	M-4	235
6830-22	M-5	370
6830-23	M-6	195
6830-24	M-7	190
6830-25	M-8	180

Lab Number:	6830-1
Sample Designation:	M-1
Date analyzed:	5/16/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
.1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
OMODICHLOROMETHANE	BDL	5
-DICHLOROPROPANE	BDL	5
trans-DICHLOROPROPENE	BDL	5
LOROETHYLENE	TRACE	5
E	TRACE	5
is-DICHLOROPROPENE	BDL	5
-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
ROMOCHLOROMETHANE	BDL	5
MOFORM	BDL	5
TRACHLOROETHYLENE	BDL	5
,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6830-2
Sample Designation: M-2
Date analyzed: 5/16/86
Matrix: WATER

VOLATILE ORGANICS	CONCENTRATION REP. 1 (ug/L)	REP. 2 (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	BDL	10
VINYL CHLORIDE	BDL	BDL	10
CHLOROETHANE	BDL	BDL	5
BROMOMETHANE	BDL	BDL	10
METHYLENE CHLORIDE	BDL	BDL	5
1,1-DICHLOROETHYLENE	BDL	BDL	5
1,1-DICHLOROETHANE	BDL	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	BDL	5
CHLOROFORM	BDL	BDL	5
.2-DICHLOROETHANE	BDL	BDL	5
1,1-TRICHLOROETHANE	BDL	BDL	5
BON TETRACHLORIDE	BDL	BDL	5
10DICHLOROMETHANE	BDL	BDL	5
DICHLOROPROPANE	BDL	BDL	5
ans-DICHLOROPROPENE	BDL	BDL	5
OROETHYLENE	BDL	BDL	5
E	BDL	BDL	5
is-DICHLOROPROPENE	BDL	BDL	5
2-TRICHLOROETHANE	BDL	BDL	5
LOROETHYL VINYL ETHER	BDL	BDL	5
OMOCHLOROMETHANE	BDL	BDL	5
OMOFORM	BDL	BDL	5
TRACHLOROETHYLENE	BDL	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	BDL	5
TOLUENE	BDL	BDL	5
CHLOROBENZENE	BDL	BDL	5
ETHYLBENZENE	BDL	BDL	5
ACETONE	BDL	BDL	25
CARBON DISULFIDE	BDL	BDL	5
THF	BDL	BDL	25
MEK	BDL	BDL	25
VINYL ACETATE	BDL	BDL	10
MIBK	BDL	BDL	25
2-HEXANONE	BDL	BDL	25
STYRENE	BDL	BDL	5
XYLENES	BDL	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	6830-3
Sample Designation:	M-3
Date analyzed:	5/16/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	29	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	11	5
CHLOROFORM	BDL	5
',2-DICHLOROETHANE	BDL	5
1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
MODICHLOROMETHANE	BDL	5
DICHLOROPROPANE	BDL	5
rans-DICHLOROPROPENE	BDL	5
OROETHYLENE	TRACE	5
-	BDL	5
-DICHLOROPROPENE	BDL	5
-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
ROMOCHLOROMETHANE	BDL	5
MOFORM	BDL	5
TRACHLOROETHYLENE	BDL	5
,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6830-4
Sample Designation: M-4
Date analyzed: 5/16/86
Matrix: WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	25	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
,1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
OMODICHLOROMETHANE	BDL	5
-DICHLOROPROPANE	BDL	5
trans-DICHLOROPROPENE	BDL	5
LOROETHYLENE	BDL	5
E	BDL	5
s-DICHLOROPROPENE	BDL	5
2-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
ROMOCHLOROMETHANE	BDL	5
MOFORM	BDL	5
TRACHLOROETHYLENE	BDL	5
,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	6030-5
Sample Designation:	M-5
Date analyzed:	5/16/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
,1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
OMODICHLOROMETHANE	BDL	5
-DICHLOROPROPANE	BDL	5
trans-DICHLOROPROPENE	BDL	5
LOROETHYLENE	BDL	5
E	BDL	5
is-DICHLOROPROPENE	BDL	5
2-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
ROMOCHLOROMETHANE	BDL	5
MOFORM	BDL	5
TRACHLOROETHYLENE	BDL	5
,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	6830-6
Sample Designation:	M-6
Date analyzed:	5/19/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	76	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	75	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
,1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
MODICHLOROMETHANE	BDL	5
DICHLOROPROPANE	BDL	5
rans-DICHLOROPROPENE	BDL	5
OROETHYLENE	BDL	5
-	BDL	5
.s-DICHLOROPROPENE	BDL	5
-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
OMOCHLOROMETHANE	BDL	5
OFORM	BDL	5
RACHLOROETHYLENE	12	5
,1,2,2-TETRACHLOROETHANE	BDL	5
OLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	6830-7
Sample Designation:	M-7
Date analyzed:	5/19/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
,1,1-TRICHLOROETHANE	BDL	5
RBON TETRACHLORIDE	BDL	5
)MODICHLOROMETHANE	BDL	5
-DICHLOROPROPANE	BDL	5
trans-DICHLOROPROPENE	BDL	5
OROETHYLENE	BDL	5
Z	BDL	5
.S--DICHLOROPROPENE	BDL	5
.-TRICHLOROETHANE	BDL	5
LOROETHYL VINYL ETHER	BDL	5
(OMOCHLOROMETHANE	BDL	5
MOFORM	BDL	5
TRACHLOROETHYLENE	BDL	5
,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	6830-8
Sample Designation:	M-8
Date analyzed:	5/19/86
Matrix:	WATER

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	20
VINYL CHLORIDE	600	20
CHLOROETHANE	BDL	10
BROMOMETHANE	BDL	20
METHYLENE CHLORIDE	BDL	10
1,1-DICHLOROETHYLENE	BDL	10
1,1-DICHLOROETHANE	BDL	10
1,2-trans-DICHLOROETHYLENE	1600	10
CHLOROFORM	BDL	10
1,2-DICHLOROETHANE	BDL	10
1,1-TRICHLOROETHANE	BDL	10
RBON TETRACHLORIDE	BDL	10
MODICHLOROMETHANE	BDL	10
DICHLOROPROPANE	BDL	10
rans-DICHLOROPROPENE	BDL	10
OROETHYLENE	26	10
E	BDL	10
is-DICHLOROPROPENE	BDL	10
2-TRICHLOROETHANE	BDL	10
LOROETHYL VINYL ETHER	BDL	10
ROMOCHLOROMETHANE	BDL	10
OMOFORM	BDL	10
TRACHLOROETHYLENE	BDL	10
,1,2,2-TETRACHLOROETHANE	BDL	10
TOLUENE	BDL	10
CHLOROBENZENE	BDL	10
ETHYLBENZENE	BDL	10
ACETONE	BDL	50
CARBON DISULFIDE	BDL	10
THF	BDL	50
MEK	BDL	50
VINYL ACETATE	BDL	20
MIBK	BDL	50
2-HEXANONE	BDL	50
STYRENE	BDL	10
XYLENES	BDL	10

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 6830-9
Sample Designation: TRIP BLANK
Date analyzed: 5/19/86
Matrix: WATER

VOLATILE ORGANICS	CONCENTRATION REP. 1 (ug/L)	REP. 2 (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	BDL	10
VINYL CHLORIDE	BDL	BDL	10
CHLOROETHANE	BDL	BDL	5
BROMOMETHANE	BDL	BDL	10
METHYLENE CHLORIDE	BDL	BDL	5
1,1-DICHLOROETHYLENE	BDL	BDL	5
1,1-DICHLOROETHANE	BDL	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	BDL	5
.OROFORM	BDL	BDL	5
-DICHLOROETHANE	BDL	BDL	5
1-TRICHLOROETHANE	BDL	BDL	5
N TETRACHLORIDE	BDL	BDL	5
TCHLOROMETHANE	BDL	BDL	5
HLOROPROPANE	BDL	BDL	5
is-DICHLOROPROPENE	BDL	BDL	5
DROETHYLENE	BDL	BDL	5
NE	BDL	BDL	5
is-DICHLOROPROPENE	BDL	BDL	5
2-TRICHLOROETHANE	BDL	BDL	5
HLOROETHYL VINYL ETHER	BDL	BDL	5
.ROMOCHLOROMETHANE	BDL	BDL	5
OMOFORM	BDL	BDL	5
ETRACHLOROETHYLENE	BDL	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	BDL	5
TOLUENE	BDL	BDL	5
CHLOROBENZENE	BDL	BDL	5
ETHYLBENZENE	BDL	BDL	5
ACETONE	BDL	BDL	25
CARBON DISULFIDE	BDL	BDL	5
THF	BDL	BDL	25
MEK	BDL	BDL	25
VINYL ACETATE	BDL	BDL	10
MIBK	BDL	BDL	25
2-HEXANONE	BDL	BDL	25
STYRENE	BDL	BDL	5
XYLENES	BDL	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler & Hill
P.O. Box 4696
Protsmouth, NH 03801

PO # ATF Davidson

Date Received: 8/7/86 (815)

Lab Number: 7472

Date Reported: 8/20/86

Date Reissued: 10/13/86

Attached please find test results for Volatile Organic Compounds and Barium.

Date 10/13/86

h

Technical Director

LOCATION: ATF DAVIDSON, WHITINSVILLE, MA

ENGINEERS: Caswell, Eichler and Hill, Inc.

SAMPLING DATE: 8/6/86

WELL NUMBER	TOTAL DEPTH	DIAMETER	TIME	STATIC LEVEL TO STEEL CASING	COND/TEMP umhos/cm	°C	pH
M-1	14'	1.5"	1100	8.67'	338	17.5	7.87
M-2	12'	1.5"	1045	8.83'	152	18.5	8.96
M-3	10'	1.5"	1330	7.00'	275	21.0	6.03
M-4	10'	1.5"	1225	7.79'	270	22.0	6.78
M-5	10'	1.5"	1125	7.65'	418	20.5	7.41
M-6	10'	1.5"	1415	7.60'	230	21.5	6.91
M-7	9.5'	1.5"	1135	7.04'	210	19.0	10.39
M-8	9.8'	1.5"	1435	7.48'	208	20.0	7.06

Total depths come from the well plans.

CHAIN OF CUSTODY DOCUMENTATION

pH Calibration 7= 7.00 10= 9.93 4= 4.13

CLIENT CEH

ADDRESS P.O. Box 4196 Portsmouth, NH 03801

JOB NAME/NUMBER

PROJECT CONTACT Matt Fichler

SAMPLING LOCATION BTF [illegible] Whitinsville, MA SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
7/6/86 Date M-2 Time 1155		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	pH 8.96
Date M-2 Time 1045		○ Solid ● Liquid ○ Other	○ P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	SC 8'10' / 152; °C 18.5
Date M-1 Time 1215		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	pH 7.87
Date M-1 Time 1100		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	SC 8'8" / 338; °C 17.5
Date M-3 Time 1348		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none	cool	pH 6.03
Date M-3 Time 1330		○ Solid ● Liquid. ○ Other	○ P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	SC 7'0" / 275; °C 21.0
Date M-4 Time 1240		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	pH 6.78
Date M-4 Time 1225		○ Solid ● Liquid ○ Other	● P/ 250 mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ● none	cool	SC 7'9.5" / 270; °C 22.0

Relinquished By:	Date	Time	Received By:	Date	Time
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Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: CEH
ADDRESS: P.O. Box 7496
Portsmouth, NH 03801

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Fidler
SAMPLING LOCATION: ATF Davidson, Whitinsville, MA
SAMPLE COLLECTOR: D. [illegible]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
6/6/86 Date M-5 Time 1200		Liquid	P/ 250 mL	none	cool	pH 7.41
Date M-5 Time 1125		Liquid	P/ 250 mL	none	cool	SC 7'7 3/4" / 412; °C 20.5
Date M-6 Time 1423		Liquid	P/ 250 mL	none	cool	pH 6.91
Date M-6 Time 1415		Liquid	P/ 250 mL	none	cool	SC 7'7 1/4" / 230; °C 21.5
Date M-7 Time 1210		Liquid	P/ 250 mL	none	cool	pH 10.09
Date M-7 Time 1135		Liquid	P/ 250 mL	none	cool	SC 7'11" / 210; °C 19.0
Date M-8 Time 1450		Liquid	P/ 250 mL	none	cool	pH 7.06
Date M-8 Time 1435		Liquid	P/ 250 mL	none	cool	SC 7'5 1/4" / 208; °C 20.0

Relinquished By:	Date	Time	Received By:	Date	Time
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page 3 of 5

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: SEH

ADDRESS: P.O. Box 4196
Portsmouth, NH 03801

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Eichler

SAMPLING LOCATION: ATF Davidson Whitinsville, MA SAMPLE COLLECTOR: D. Turbes 2010

FIELD IDENTIFICATION (List each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
8/6/86 Date M-1 Time 1110		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	VOA - EPA 624
Date M-2 Time 1055		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-3 Time 1248		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-4 Time 1240		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-5 Time 1200		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-6 Time 1123		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-7 Time 1142		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	
Date M-8 Time 1450		○ Solid ◉ Liquid ○ Other	○ P/ mL ○ G/ mL ◉ G/T/ 40 mL	○ field ○ lab ◉ none	Cool	

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Relinquished By:	**Date**	**Time**	**Received For Laboratory By:**	**Date**	**Time**
			[signature]	8/7	081

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: C.E.H.
ADDRESS: P.O. Box 4191
Portsmouth, NH 03801

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Fichler
SAMPLING LOCATION: ATF Davidson Whitinsville MA
SAMPLE COLLECTOR: [illegible]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 8/5/86 Trip blank Time PM		Liquid	G/T/40 mL	none	cool	VOA - EPA 624
Date 8/6/86 M-1 Time 1110		Liquid	P/125 mL	field	HNO_3 cool	Dissolved Barium
Date ↓ M-2 Time 1055		Liquid	P/125 mL	field	↓	↓
Date M-3 Time 1348		Liquid	P/125 mL	field		
Date M-4 Time 1240		Liquid	P/125 mL	field		
Date M-5 Time 12:00		Liquid	P/125 mL	field		
Date M-6 Time 1423		Liquid	P/125 mL	field		
Date ↓ M-7 Time 1143		Liquid	P/125 mL	field	↓	↓

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	8/7	0815			
Relinquished By:	Date	Time	Received For Laboratory By: [signature] Resource Analysis, Incorporated	8/7	08[illegible]

CHAIN OF CUSTODY DOCUMENTATION

CLIENT CEH
ADDRESS P.O. Box 4696
Portsmouth, NH 03801

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler
SAMPLING LOCATION ATF Davidson Whitinsville, MA SAMPLE COLLECTOR [illegible]

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
8/6/86 Date M-7 Time 1450		◯ Solid ⊗ Liquid ◯ Other	⊗ P/ 125 mL ◯ G/ mL ◯ G/T/ mL	⊗ field ◯ lab ◯ none	HNO_3 + Wool	Dissolved Barium
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		
Date Time		◯ Solid ◯ Liquid ◯ Other	◯ P/ mL ◯ G/ mL ◯ G/T/ mL	◯ field ◯ lab ◯ none		

Relinquished By:	Date	Time	Received By:	Date	Time
D Desantis	8/7	0815			
Relinquished By:	Date	Time	Received for Laboratory By: Laurie Clarke	8/7	0815

Resource Analysts, Incorporated

Parameter: Barium (mg/L)
Method: 303C

Matrix: Water
Date Analyzed: 8-11-86

Field Identification	Laboratory Number	Concentration
M-1	7472-10	<0.3
M-2	7472-11	<0.3
M-3	7472-12	<0.31
M-4	7472-13	0.41
M-5	7472-14	2.1
M-6	7472-15	0.51
M-7	7472-16	<0.3
M-8	7472-17	0.79

Lab Number:	7472-1
Sample Designation:	M-1
Date Analyzed:	8-10-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 7472-2
Sample Designation: M-2
Date Analyzed: 8-10-86
Matrix: Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	NO USEABLE DATA	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	NO USEABLE DATA	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7472-3
Sample Designation:	M-3
Date Analyzed:	8-10-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	12	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	31	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	Trace	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7472-4
Sample Designation:	M-4
Date Analyzed:	8-12-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	12	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7472-5
Sample Designation:	M-5
Date Analyzed:	8-10-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7472-6
Sample Designation:	M-6
Date Analyzed:	8-12-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	50
VINYL CHLORIDE	80	50
CHLOROETHANE	BDL	25
BROMOMETHANE	BDL	50
METHYLENE CHLORIDE	BDL	25
1,1-DICHLOROETHYLENE	BDL	25
1,1-DICHLOROETHANE	BDL	25
1,2-trans-DICHLOROETHYLENE	50	25
CHLOROFORM	BDL	25
1,2-DICHLOROETHANE	BDL	25
1,1,1-TRICHLOROETHANE	Trace	25
CARBON TETRACHLORIDE	BDL	25
BROMODICHLOROMETHANE	BDL	25
1,2-DICHLOROPROPANE	BDL	25
1,3-trans-DICHLOROPROPENE	BDL	25
TRICHLOROETHYLENE	Trace	25
BENZENE	BDL	25
1,3-cis-DICHLOROPROPENE	BDL	25
1,1,2-TRICHLOROETHANE	BDL	25
2-CHLOROETHYL VINYL ETHER	BDL	25
DIBROMOCHLOROMETHANE	BDL	25
BROMOFORM	BDL	25
TETRACHLOROETHYLENE	Trace	25
1,1,2,2-TETRACHLOROETHANE	BDL	25
TOLUENE	BDL	25
CHLOROBENZENE	BDL	25
ETHYLBENZENE	BDL	25
ACETONE	BDL	125
CARBON DISULFIDE	BDL	25
THF	BDL	125
MEK	BDL	125
VINYL ACETATE	BDL	50
MIBK	BDL	125
2-HEXANONE	BDL	125
STYRENE	BDL	25
XYLENES	BDL	25

"Trace" denotes probable presence below listed detection limit. Detection limit raised due to the foaming properties of the sample.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7472-7
Sample Designation:	M-7
Date Analyzed:	8-10-86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	NO USEABLE DATA	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	NO USEABLE DATA	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number:	7872-8
Sample Designation:	M-8
Date Analyzed:	8/12/86
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	220	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	720	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	15	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Lab Number: 7472-9
Sample Designation: Trip Blank
Date Analyzed: 8-12-86
Matrix: Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA 600/4-82-057 METHOD 624

Resource Analysts, Incorporated

Complete

ADDITIONAL M-8 INVESTIGATIONS

ATF/DAVIDSON ARCADE FACILITY

WHITINSVILLE, MASSACHUSETTS

Submitted to:

WHITE CONSOLIDATED INDUSTRIES

COLUMBUS, OHIO

Prepared by:

Caswell, Eichler and Hill, Inc.
Portsmouth, New Hampshire

March 1987

CEH Caswell, Eichler and Hill, Inc.
GEOLOGY HYDROLOGY GEOPHYSICS

Portsmouth, New Hampshire
West Topsham, Vermont
Augusta, Maine

CEH Caswell, Eichler and Hill, Inc.
GEOLOGY HYDROLOGY GEOPHYSICS
P.O. Box 4696
Portsmouth, NH 03801
TEL. (603) 431-4899

March 25, 1987

White Consolidated Industries, Inc.
300 Phillippi Road
Columbus, Ohio 43228

Attn: Mr. Daniel Marques, P.E.

Re: Additional Monitoring Well Installation, Soil Sampling and Analysis, and Groundwater Sampling and Analysis at the ATF/Davidson Arcade Facility, Whitinsville, Massachusetts

Dear Dan:

Consistent with the agreements reached at our November 1986 meeting with Ms. Carol de Groot of the Massachusetts Department of Environmental Quality Engineering (DEQE), we designed an additional monitoring and sampling program in the vicinity of monitoring well M-8 at the Arcade. On December 16, 1986 we met with Carol, reviewed the work plan, and obtained her approval to proceed. The scope of work consisted of installing and developing three additional monitoring wells (M-9, M-10 and M-11) at the site, collecting soil samples above and below the water table at the new well locations, and collecting groundwater samples from the new wells and existing wells M-6, M-7 and M-8. The wells were to be constructed of 1½ inch, flush joint, schedule 40, PVC. Five feet of ten-slot screen was to be placed at and below the water table, sand packed and isolated by a bentonite seal. Solid PVC riser was to continue from the top of the screen to above land surface. The wells were to be pumped until free of fines. The soil and groundwater samples were to be analyzed for volatile organic compounds (EPA-624) by GC/MS method. The overall thrust of the additional work was to determine if the contamination observed at M-8 is localized, or emanating from an hydraulically upgradient location.

On December 22, 1986, a CEH drilling, well construction and sampling crew under the supervision of CEH principal Matthew F. Eichler III mobilized to the site and completed all the necessary field work. Using a General 440 portable power auger unit, the wells were constructed to specification. The augers were thoroughly cleansed with deionized water and methanol between borings. Soil samples were collected from above and below the water table, placed in air-tight double plastic bags, and stored in an ice chest for transport to Resource Analysts, Inc. for laboratory analysis. Soil samples

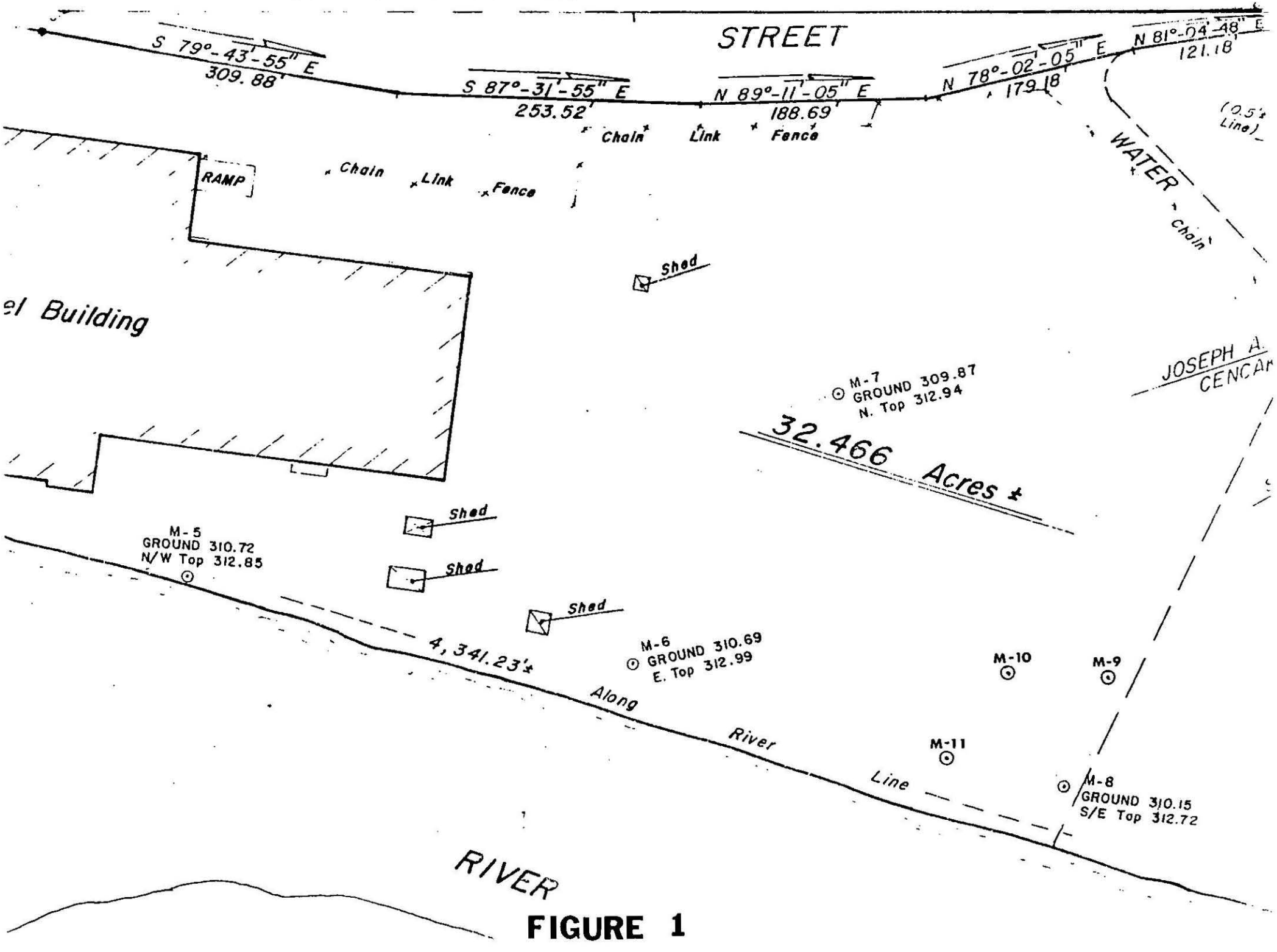
STREET
S 79°-43'-55" E
309.88
S 87°-31'-55" E
253.52
N 89°-11'-05" E
188.69
N 78°-02'-05" E
179.18
N 81°-04'-48" E
121.18
Chain Link Fence
RAMP
Chain Link Fence
WATER
Chain
(0.5' Line)
Shed
el Building
M-7
GROUND 309.87
N. Top 312.94
32.466 Acres ±
JOSEPH A.
CENCAr
Shed
M-5
GROUND 310.72
N/W Top 312.85
Shed
Shed
M-6
GROUND 310.69
E. Top 312.99
4,341.23'±
Along River Line
M-10
M-9
M-11
M-8
GROUND 310.15
S/E Top 312.72
RIVER

FIGURE 1

were noted to be the same coarse grained foundry fill as was observed during earlier well installations. Each well was pump developed for one hour using a peristaltic pump and dedicated polyethylene tubing. Each well produced a continuous flow of groundwater, and was noted to be clear of fines after 2-5 minutes. Groundwater samples were taken with dedicated teflon bailers and teflon coated stainless steel cable. The samples were immediately packed in ice for transport to the laboratory.

As seen on Figure 1, the new wells (M-9, M-10, M-11) were positioned in radial fashion around the hydraulically upgradient area surrounding M-8. Each well is approximately 100 feet from M-8 and its adjacent counterpart. Laboratory analyses of the soil and groundwater samples are contained in Appendix A. As these data indicate, the upgradient area surrounding M-8 is essentially clean. Only trace and low levels of the contaminants (48µg/l Tetrachloroethylene) found in M-8 are observed in the M-9 groundwater sample, and none were found in M-10 or M-11. The soil samples were also nearly devoid of any contaminants found in M-8. An extremely low level of Tetrachloroethylene (1.2 µg/g) was reported in the M-9 sample. Similarly, minute levels of Toluene (0.6-4.8 µg/g) were also reported in each soil sample.

Analysis of these data lead us to conclude that the contamination historically observed at M-8 is characteristic of a localized zone of groundwater degradation. In that groundwater and the contaminants are obviously flowing toward, and being diluted by the adjacent river, no emergency health hazard appears to exist.

We hope these additional analyses will prove helpful to you and the DEQE. Please call should you have any questions or additional needs.

Very truly yours,
Caswell, Eichler and Hill, Inc.

Matthew F. Eichler III
Principal

MFE/amk

APPENDIX A

WATER QUALITY DATA

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler, & Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 12/23/86 (1300

Lab Number: 8593

Date Reported: 1/13/87

Attached please find test results for Volatile Organic Compounds.

S

Technical Director

Date 1/13/87

page ____ of ____

CHAIN OF CUSTODY DOCUMENTATION

CLIENT CAMWELL EICHLER & HILL, INC.
ADDRESS P.O. BOX 4696
PORTSMOUTH, N.H. 03801

JOB NAME/NUMBER ATF/DAVIDSON

PROJECT CONTACT MATT EICHLER
SAMPLING LOCATION ATF/DAVIDSON WHITINSVILLE MA. SAMPLE COLLECTOR MATT EICHLER

FIELD IDENTIFICATION (List each container separately)	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
B-11 ABOVE WATER TABLE Date 12/22/86 Time 3:00 PM	8593-1	⊘ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ⊘ none		9DA/624
B-11 BELOW WATER TABLE Date 12/22/86 Time 3:00 PM	2	⊘ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ⊘ none		
B-9 ABOVE WATER TABLE Date 12/22/86 Time 1:00 PM	3	⊘ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ⊘ none		
B-10 ABOVE WATER TABLE Date 12/22/86 Time 2:00 PM	4	⊘ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ⊘ none		
B-10 BELOW WATER TABLE Date 12/22/86 Time 2:00 PM	5	⊘ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ⊘ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Ti
[signature]	12/23/86	12:53			
Relinquished By:	Date	Time	Received For Laboratory By:	Date	Ti
			[signature]	12/23/86	2

Resource Analysts, Incorporated

Lab Number:	8593-1
Sample Designation:	B-11 Above Water Table
Date Analyzed:	1/2/87
Matrix:	Solid

Results expressed on a dry (103 degrees C) basis.

VOLATILE ORGANICS	CONCENTRATION (ug/g)	DETECTION LIMIT (ug/g)
CHLOROMETHANE	BDL	1
VINYL CHLORIDE	BDL	1
CHLOROETHANE	BDL	.5
BROMOMETHANE	BDL	1
METHYLENE CHLORIDE	BDL	.5
1,1-DICHLOROETHYLENE	BDL	.5
1,1-DICHLOROETHANE	BDL	.5
1,2-trans-DICHLOROETHYLENE	BDL	.5
CHLOROFORM	BDL	.5
1,2-DICHLOROETHANE	BDL	.5
1,1,1-TRICHLOROETHANE	BDL	.5
CARBON TETRACHLORIDE	BDL	.5
BROMODICHLOROMETHANE	BDL	.5
1,2-DICHLOROPROPANE	BDL	.5
1,3-trans-DICHLOROPROPENE	BDL	.5
TRICHLOROETHYLENE	BDL	.5
BENZENE	BDL	.5
1,3-cis-DICHLOROPROPENE	BDL	.5
1,1,2-TRICHLOROETHANE	BDL	.5
2-CHLOROETHYL VINYL ETHER	BDL	.5
DIBROMOCHLOROMETHANE	BDL	.5
BROMOFORM	BDL	.5
TETRACHLOROETHYLENE	BDL	.5
1,1,2,2-TETRACHLOROETHANE	BDL	.5
TOLUENE	4.3	.5
CHLOROBENZENE	BDL	.5
ETHYLBENZENE	BDL	.5
ACETONE	BDL	2.5
CARBON DISULFIDE	BDL	.5
THF	BDL	2.5
MEK	BDL	2.5
VINYL ACETATE	BDL	1
MIBK	BDL	2.5
2-HEXANONE	BDL	2.5
STYRENE	BDL	.5
XYLENES	BDL	.5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA SW 846, 2nd Edition METHOD 8240

Resource Analysts, Incorporated

Lab Number: 8593-2
Sample Designation: B-11 Below Water Table
Date Analyzed: 1/2/87
Matrix: Solid

Results expressed on a dry (103 degrees C) basis.

VOLATILE ORGANICS	CONCENTRATION (ug/g)	DETECTION LIMIT (ug/g)
CHLOROMETHANE	BDL	1
VINYL CHLORIDE	BDL	1
CHLOROETHANE	BDL	.5
BROMOMETHANE	BDL	1
METHYLENE CHLORIDE	BDL	.5
1,1-DICHLOROETHYLENE	BDL	.5
1,1-DICHLOROETHANE	BDL	.5
1,2-trans-DICHLOROETHYLENE	BDL	.5
CHLOROFORM	BDL	.5
1,2-DICHLOROETHANE	BDL	.5
1,1,1-TRICHLOROETHANE	BDL	.5
CARBON TETRACHLORIDE	BDL	.5
BROMODICHLOROMETHANE	BDL	.5
1,2-DICHLOROPROPANE	BDL	.5
1,3-trans-DICHLOROPROPENE	BDL	.5
TRICHLOROETHYLENE	BDL	.5
BENZENE	BDL	.5
1,3-cis-DICHLOROPROPENE	BDL	.5
1,1,2-TRICHLOROETHANE	BDL	.5
2-CHLOROETHYL VINYL ETHER	BDL	.5
DIBROMOCHLOROMETHANE	BDL	.5
BROMOFORM	BDL	.5
TETRACHLOROETHYLENE	BDL	.5
1,1,2,2-TETRACHLOROETHANE	BDL	.5
TOLUENE	.6	.5
CHLOROBENZENE	BDL	.5
ETHYLBENZENE	BDL	.5
ACETONE	BDL	2.5
CARBON DISULFIDE	BDL	.5
THF	BDL	2.5
MEK	BDL	2.5
VINYL ACETATE	BDL	1
MIBK	BDL	2.5
2-HEXANONE	BDL	2.5
STYRENE	BDL	.5
XYLENES	BDL	.5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA SW 846, 2nd Edition METHOD 8240

Lab Number: 8593-3
Sample Designation: B-9 Above Water Table
Date Analyzed: 1/2/87
Matrix: Solid

Results expressed on a dry (103 degrees C) basis.

VOLATILE ORGANICS	CONCENTRATION (ug/g)	DETECTION LIMIT (ug/g)
CHLOROMETHANE	BDL	1
VINYL CHLORIDE	BDL	1
CHLOROETHANE	BDL	.5
BROMOMETHANE	BDL	1
METHYLENE CHLORIDE	BDL	.5
1,1-DICHLOROETHYLENE	BDL	.5
1,1-DICHLOROETHANE	BDL	.5
1,2-trans-DICHLOROETHYLENE	BDL	.5
CHLOROFORM	BDL	.5
1,2-DICHLOROETHANE	BDL	.5
1,1,1-TRICHLOROETHANE	BDL	.5
CARBON TETRACHLORIDE	BDL	.5
BROMODICHLOROMETHANE	BDL	.5
1,2-DICHLOROPROPANE	BDL	.5
1,3-trans-DICHLOROPROPENE	BDL	.5
TRICHLOROETHYLENE	BDL	.5
BENZENE	BDL	.5
1,3-cis-DICHLOROPROPENE	BDL	.5
1,1,2-TRICHLOROETHANE	BDL	.5
2-CHLOROETHYL VINYL ETHER	BDL	.5
DIBROMOCHLOROMETHANE	BDL	.5
BROMOFORM	BDL	.5
TETRACHLOROETHYLENE	1.2	.5
1,1,2,2-TETRACHLOROETHANE	BDL	.5
TOLUENE	3.8	.5
CHLOROBENZENE	BDL	.5
ETHYLBENZENE	BDL	.5
ACETONE	BDL	2.5
CARBON DISULFIDE	BDL	.5
THF	BDL	2.5
MEK	BDL	2.5
VINYL ACETATE	BDL	1
MIBK	BDL	2.5
2-HEXANONE	BDL	2.5
STYRENE	BDL	.5
XYLENES	BDL	.5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA SW 846, 2nd Edition METHOD 8240

Lab Number: 8593-4
Sample Designation: B-10 Above Water Table
Date Analyzed: 1/6/87
Matrix: Solid

Results expressed on a dry (103 degrees C) basis.

VOLATILE ORGANICS	CONCENTRATION (ug/g)	DETECTION LIMIT (ug/g)
CHLOROMETHANE	BDL	1
VINYL CHLORIDE	BDL	1
CHLOROETHANE	BDL	.5
BROMOMETHANE	BDL	1
METHYLENE CHLORIDE	BDL	.5
1,1-DICHLOROETHYLENE	BDL	.5
1,1-DICHLOROETHANE	BDL	.5
1,2-trans-DICHLOROETHYLENE	BDL	.5
CHLOROFORM	BDL	.5
1,2-DICHLOROETHANE	BDL	.5
1,1,1-TRICHLOROETHANE	BDL	.5
CARBON TETRACHLORIDE	BDL	.5
BROMODICHLOROMETHANE	BDL	.5
1,2-DICHLOROPROPANE	BDL	.5
1,3-trans-DICHLOROPROPENE	BDL	.5
TRICHLOROETHYLENE	BDL	.5
BENZENE	BDL	.5
1,3-cis-DICHLOROPROPENE	BDL	.5
1,1,2-TRICHLOROETHANE	BDL	.5
2-CHLOROETHYL VINYL ETHER	BDL	.5
DIBROMOCHLOROMETHANE	BDL	.5
BROMOFORM	BDL	.5
TETRACHLOROETHYLENE	BDL	.5
1,1,2,2-TETRACHLOROETHANE	BDL	.5
TOLUENE	2.7	.5
CHLOROBENZENE	BDL	.5
ETHYLBENZENE	BDL	.5
ACETONE	BDL	2.5
CARBON DISULFIDE	BDL	.5
THF	BDL	2.5
MEK	BDL	2.5
VINYL ACETATE	BDL	1
MIBK	BDL	2.5
2-HEXANONE	BDL	2.5
STYRENE	BDL	.5
XYLENES	BDL	.5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA SW 846, 2nd Edition METHOD 8240

Lab Number: 8593-5
Sample Designation: B-10 Below Water Table
Date Analyzed: 1/2/87
Matrix: Solid

Results expressed on a dry (103 degrees C) basis.

VOLATILE ORGANICS	CONCENTRATION (ug/g)	DETECTION LIMIT (ug/g)
CHLOROMETHANE	BDL	1
VINYL CHLORIDE	BDL	1
CHLOROETHANE	BDL	.5
BROMOMETHANE	BDL	1
METHYLENE CHLORIDE	BDL	.5
1,1-DICHLOROETHYLENE	BDL	.5
1,1-DICHLOROETHANE	BDL	.5
1,2-trans-DICHLOROETHYLENE	BDL	.5
CHLOROFORM	BDL	.5
1,2-DICHLOROETHANE	BDL	.5
1,1,1-TRICHLOROETHANE	BDL	.5
CARBON TETRACHLORIDE	BDL	.5
BROMODICHLOROMETHANE	BDL	.5
1,2-DICHLOROPROPANE	BDL	.5
1,3-trans-DICHLOROPROPENE	BDL	.5
TRICHLOROETHYLENE	BDL	.5
BENZENE	BDL	.5
1,3-cis-DICHLOROPROPENE	BDL	.5
1,1,2-TRICHLOROETHANE	BDL	.5
2-CHLOROETHYL VINYL ETHER	BDL	.5
DIBROMOCHLOROMETHANE	BDL	.5
BROMOFORM	BDL	.5
TETRACHLOROETHYLENE	BDL	.5
1,1,2,2-TETRACHLOROETHANE	BDL	.5
TOLUENE	4.8	.5
CHLOROBENZENE	BDL	.5
ETHYLBENZENE	BDL	.5
ACETONE	BDL	2.5
CARBON DISULFIDE	BDL	.5
THF	BDL	2.5
MEK	BDL	2.5
VINYL ACETATE	BDL	1
MIBK	BDL	2.5
2-HEXANONE	BDL	2.5
STYRENE	BDL	.5
XYLENES	BDL	.5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: EPA SW 846, 2nd Edition METHOD 8240

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
ATF/Davidson
C/O Caswell, Eichler & Hill
Box 4696
Portsmouth, NH 03801

PO # Whitinsville, MA

Date Received: 1/27/87 (150

Lab Number: 8806

Date Reported: 2/10/87

Attached please find test results for Volatile Organic Compounds.

Russell Foster h

Date 2/10/87

h

Technical Director

CHAIN OF CUSTODY DOCUMENTATION

M-6

CLIENT ATF/ Davidson

ADDRESS c/o CEH
Box 4696 Portsmouth, NH
03801

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler

SAMPLING LOCATION Whitinsville MA

SAMPLE COLLECTOR B. Bline (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 1/24/87 Time 11:45	8806-1	Liquid	G/T/ 2x40 mL	none	4°C	VOA
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		
Date Time		Solid / Liquid / Other	P/ mL G/ mL G/T/ mL	field / lab / none		

Relinquished By:	Date	Time	Received By:	Date	Time
Bruce Bline (signature)	1/25/87	9:45			

Relinquished By:	Date	Time	Received for Laboratory By:	Date	Time
(signature)	1-27	1500	S Channell (signature)	1/27	1500

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

M-8

CLIENT: ATF/ Davidson
ADDRESS: c/o CEH
Box 4696 Portsmouth, NH 03801

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Eichler
SAMPLING LOCATION: Whitinsville MA
SAMPLE COLLECTOR: B. Bline (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 1/24/87 Time 12:15	8806-3	○ Solid ● Liquid ○ Other	○ P/ mL ○ G/2x40 mL ● G/T/ mL	○ field ○ lab ● none	4°C	VOA
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	1/25/87	9:45			
Relinquished By: [signature]	1-27	1500	Received for Laboratory By: [signature]	1/27	1800

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

M-7

CLIENT: ATF/ Davidson
ADDRESS: c/o CEH
Box 4696 Portsmouth, NH 03801

JOB NAME/NUMBER:

PROJECT CONTACT: Matt Eichler
SAMPLING LOCATION: Whitinsville MA

SAMPLE COLLECTOR: B. Bline (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 1/24/87 Time 12:50	8806-2	○ Solid ● Liquid ○ Other	○ P/ mL ○ G/2x40 mL ● G/T/ mL	○ field ○ lab ● none	4°C	VOA
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Brian Bline	1/25/87	9:45			
Relinquished By: [signature]	1-27-	1500	Received For Laboratory By: [signature] Resource Analysts, Incorporated	1/27	1500

CHAIN OF CUSTODY DOCUMENTATION

M-10

CLIENT ATF/ Davidson
ADDRESS c/o CEH
Box 4696 Portsmouth, NH 03801

JOB NAME/NUMBER

PROJECT CONTACT Matt Eichler
SAMPLING LOCATION Whitinsville MA

SAMPLE COLLECTOR B. Bline (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 1/24/87 Time 13:20	8806-4	○ Solid ● Liquid ○ Other	○ P/ mL ○ G/2x40 mL ● G/T/ mL	○ field ○ lab ● none	4°C	VOA
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	1/25/87	9:45			
[signature]	1-27	1500	Received For Laboratory By: [signature]	1/27	1500

Resource Analysts, Incorporated

CHAIN OF CUSTODY DOCUMENTATION

M-11

CLIENT ATF/ Davidson
ADDRESS c/o CEH
Box 4696 Portsmouth, NH 03801

PROJECT CONTACT Matt Eichler
SAMPLING LOCATION Whitinsville MA

JOB NAME/NUMBER
SAMPLE COLLECTOR B. Bline (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
Date 1/24/87 Time 14:05	8806-5	○ Solid ● Liquid ○ Other	○ P/ mL ○ G/2x40 mL ● G/T/ mL	○ field ○ lab ● none	4°C	VOA
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Anne Bline	1/25/87	9:45			
Relinquished By: [signature]	1-27	1500	Received For Laboratory By: [signature] Resource Analysts, Incorporated	1/[illegible]	1800

Lab Number:	8806-1
Sample Designation:	M-6
Date Analyzed:	1/30/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	48	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	13	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	7.6	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	13	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

Lab Number:	8806-2
Sample Designation:	M-7
Date Analyzed:	2/3/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

Lab Number:	8806-3
Sample Designation:	M-8
Date Analyzed:	2/2/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	280	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	640	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	17	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

Lab Number:	8806-4
Sample Designation:	M-10
Date Analyzed:	2/2/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

Lab Number:	8806-5
Sample Designation:	M-11
Date Analyzed:	2/2/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	BDL	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	BDL	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

RAI

Resource Analysts, Incorporated
Box 4778 Hampton, NH 03842
(603) 926-7777

TO:

Mr. Matt Eichler
Caswell, Eichler & Hill
P.O. Box 4696
Portsmouth, NH 03801

PO # ATF Davidson

Date Received: 3/13/87 (13

Lab Number: 9143

Date Reported: 3/18/87

Attached please find test results for Volatile Organic Compounds.

Russell Fisher Date 3/18/87

h

Technical Director

CHAIN OF CUSTODY DOCUMENTATION

CLIENT ATF DAVIDSON

ADDRESS : Whitinsville, ...

JOB NAME/NUMBER

PROJECT CONTACT JOE MENENDEZ

SAMPLING LOCATION m-9

SAMPLE COLLECTOR Bruce BLINE (CEH)

FIELD IDENTIFICATION list each container separately	LAB #	SAMPLE MATRIX	CONTAINER TYPE/VOLUME	FILTRATION	FIELD PRESERVATION	REMARKS/ANALYSIS REQUESTED
9143 Date 3/13/87 Time 1:15	9143	○ Solid ⊙ Liquid ○ Other	○ P/ mL ○ G/2x40 mL ⊙ G/T/ mL	○ field ○ lab ⊙ none	4°C	VOA
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		
Date Time		○ Solid ○ Liquid ○ Other	○ P/ mL ○ G/ mL ○ G/T/ mL	○ field ○ lab ○ none		

Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By: Bruce Bline	3/13/87	13:19	Received For Laboratory By: Beth O'Brien	3/13/87	13:19

Resource Analysts, Incorporated

Lab Number:	9143-1
Sample Designation:	M-9 ATF Davidson
Date Analyzed:	3/16/87
Matrix:	Water

VOLATILE ORGANICS	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
CHLOROMETHANE	BDL	10
VINYL CHLORIDE	BDL	10
CHLOROETHANE	BDL	5
BROMOMETHANE	BDL	10
METHYLENE CHLORIDE	BDL	5
1,1-DICHLOROETHYLENE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-trans-DICHLOROETHYLENE	Trace	5
CHLOROFORM	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1,1-TRICHLOROETHANE	BDL	5
CARBON TETRACHLORIDE	BDL	5
BROMODICHLOROMETHANE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
1,3-trans-DICHLOROPROPENE	BDL	5
TRICHLOROETHYLENE	Trace	5
BENZENE	BDL	5
1,3-cis-DICHLOROPROPENE	BDL	5
1,1,2-TRICHLOROETHANE	BDL	5
2-CHLOROETHYL VINYL ETHER	BDL	5
DIBROMOCHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
TETRACHLOROETHYLENE	48	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TOLUENE	BDL	5
CHLOROBENZENE	BDL	5
ETHYLBENZENE	BDL	5
ACETONE	BDL	25
CARBON DISULFIDE	BDL	5
THF	BDL	25
MEK	BDL	25
VINYL ACETATE	BDL	10
MIBK	BDL	25
2-HEXANONE	BDL	25
STYRENE	BDL	5
XYLENES	BDL	5

"Trace" denotes probable presence below listed detection limit.

BDL = BELOW DETECTION LIMIT
METHOD REFERENCE: 40 CFR PART 136, FRIDAY, OCTOBER 26, 1984
METHOD 624

Resource Analysts, Incorporated

Complete

RISK ASSESSMENT
OF
AREA SURROUNDING M - 8
AT THE
ATF/DAVIDSON ARCADE FACILITY
WHITINSVILLE, MASSACHUSETTS

PREPARED FOR
WHITE CONSOLIDATED INDUSTRIES, INC.
COLUMBUS, OHIO

PREPARED BY
CASWELL, EICHLER & HILL, INC.
PORTSMOUTH, NEW HAMPSHIRE

JULY 1987

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INTRODUCTION

The purpose of this public health assessment is to evaluate the potential risks associated with exposure to certain volatile organic compounds known to exist in the ground water at the ATF/Davidson Arcade Facility, Whitinsville, Massachusetts. Past October 1985, October 1986 and March 1987 field study reports have shown the only consistent contamination of any elevated significance exists locally near monitoring well M-8. As standard procedure in this type of assessment, the impacts of this localized site condition on human health will be evaluated under baseline conditions that represent a "No-Action" remedial alternative.

The assessment is comprised of three components:

. Hazard Assessment

. Exposure Assessment

. Risk Assessment

The objectives of the Hazard Assessment are to review site investigation data, and to summarize the nature and extent of observed contamination. Based upon this review, indicator substances are normally selected for further assessment. In that only three volatile organic compounds have consistently been present in groundwater samples from monitoring well M-8, all three will be considered.

The Exposure Assessment indentifies potential receptors and exposure pathways. Additionally, concentrations of contaminants at points of exposure are estimated based on available site data and are compared to applicable public health standards and guidelines.

The Risk Assessment is a quantitative evaluation of risks associated with single and multiple chemical exposures for each identifed pathway. Projected levels of chemical intake are compared to established critical toxicity values. These values represent acceptable intake levels for

noncarcinogens, and carcinogenic potency factors for potential carcinogens.

HAZARD ASSESSMENT

SITE CHARACTERIZATION

Location And General Setting: The ATF/Davidson Arcade Facility is located on the north bank of the Mumford River, approximately one mile west of the center of town in Whitinsville, Massachusetts. The area is culturally characterized by other industrial facilities 1000 feet to the east and residential units 400 feet to the northeast. The facility is bounded by a security fence, and twenty-four hour guard service is maintained. The area is serviced by both municipal water and sewer systems.

Hydrogeologic Setting: The site is best described as a flat plain that spans 2800 feet along the north bank of the Mumford River. This plain was created by filling the river embayment with foundry bed fill that principably consists of coarse grained sand and gravel, and fine ash. The foundry that was the source of this fill since the late nineteenth century is located in the present Covitch complex east of the Arcade Facility. As described in an earlier CEH report (October 1985), the hydraulic gradient across the Arcade site is nearly flat; this finding is consistant with what would be expected, given the coarse grained nature of the fill placed in the river. Although gradual, the gradients support a flow direction toward the river.

Mumford River Hydraulics: Personal communication with the U.S Geological Survey, Water Resources Division shows that the hydraulic data concerning the river is somewhat limited, especially in the Arcade site area. Twelve years of flow records are available, however, for the East Douglas station from July, 1939 to September 1951. This station, which exists approximately three miles up-river from the site, measures flow from a 29.1 square mile drainage area. The annual average dis-

charge in this location has been calculated at 44.8 cubic feet per second (cfs). Clearly, use of these data will result in a conservative impact assessment later in this report because significant drainage basin area and concommitant flow have not been included in the analyses.

Local Wind Speed and Direction: Personal communication with the Weather Service at the Worcester Municipal Airport shows the average annual wind speed and direction at that location to be 10.2 miles per hour from the southwest.

CONTAMINANT CHARACTERIZATION

Probable Source of Contamination: Discussions with present and former employees of ATF/Davidson have been inconclusive as to the etiology of the volatile organic compounds that exist in the ground water at monitoring well M-8. Given the many years that have passed since the foundry fill was placed in this location, a buried source seems unlikely. Further, personal communications with the employees shows no evidence of subsequent burial or storage in this area. An undocumented spill, therefore, seems the only other event that could explain the existence of the noted contamination.

Contaminant Levels: As summarized in the CEH October 1986 report, volatile organic compounds found in M-8 include Trichloroethylene (TCE), trans-1,2-Dichloroethylene (t-DCE), and vinyl chloride (VC). The latter two compounds are common weathered (break-down products) species of the parent compound, Trichloroethylene. Table 1 shows the historical record of the compound concentrations.

TABLE 1

WATER QUALITY - MONITORING WELL M-8

Date	Trichloroethylene (ug/l)	trans-1,2-Dichloroethylene (ug/l)	Vinyl Chloride (ug/l)
7-18-85	30	610	260
11-13-85	Trace (≥ 10)	1100	380
2-10-86	Trace (≥ 10)	380	Trace (≥ 10)
5-13-86	26	1600	600
8-06-86	15	720	220
2-02-87	17	640	280
Average	18 (1.5%)	842 (73%)	292 (25.5%)

As these data show, the mass balance is shifted toward the weathered species. This may indicate a relatively lenghly period of time has elapsed since emplacement, or that significant biological and physio-chemical reactions have occured in a shorter time frame. New evidence suggests that the presence of aluminum silicates (somewhat prevalent in foundry bed materials), and nutrient enhanced/elevated temperature ground water (fed by upgradient surface water) can significantly accelerate the weathering process. Which time frame is accurate at the M-8 location is unknown, and may not be able to be determined given the present research data.

Aerial Extent of Contamination: The CEH March 1987 report shows the locations of additional monitoring wells (M-9, M-10 and M-11) that were placed hydraulically upgradient of M-8. Additionally, water quality results from wells M-6, M-7, M-8, M-9, M-10 and M-11 are included in the report. Given the relatively uncontaminated nature of M-9, M-10, and

M-11, a reasonable assumption may place the center of the contaminated area at M-8, with the edge of the plume extending one-half the distance toward each well. Additionally, a mirror image of this defined plume would presumably exist to the east of M-8. Figure 1 shows this plume interpretation, the surface area of which covers approximately 13,100 square feet. As mentioned earlier, ground water, and thusly the plume of contamination flow toward the adjacent river.

Properties, Criteria and Standards: Table 2 provides a summary of the physical and chemical properties of TCE, t-DCE, and VC. These properties relate to the fate of each species in given environmental media.

TABLE 2

PHYSICAL AND CHEMICAL PROPERTIES

Chemical	Molecular Weight	Melting Point (^{o}C)	Boiling Point (^{o}C)	Specific Gravity	Solubility (Water) (mg/l)	Log Octanol/ Water Partition Coefficient	Vapor Pressure (mm\Hg)
TCE	131.4	-73	87	1.464	1100	2.29	57.9
t-DCE	96.95	-50	48	1.26	600	0.48	200
VC	62.5	-153	-13.9	0.912	1100	1.40	2660

As these values show, these compounds are moderately soluble in water, and have generally high vapor pressures. Because of these properties, these compounds volatize from surface waters rapidly. The USEPA has determined the surface water half-lives for these compounds to range from a few hours (VC) to a few days (TCE).

Octanol/water partition coefficients are low to moderate, indicating that the compounds do not tend to bioaccumulate or adsorb significantly to soils. With specific gravities greater than or nearly equal to one, these compounds tend to sink in groundwater if present as a separate phase.

Table 3 summarizes the toxicity criteria and standards for TCE, t-DCE

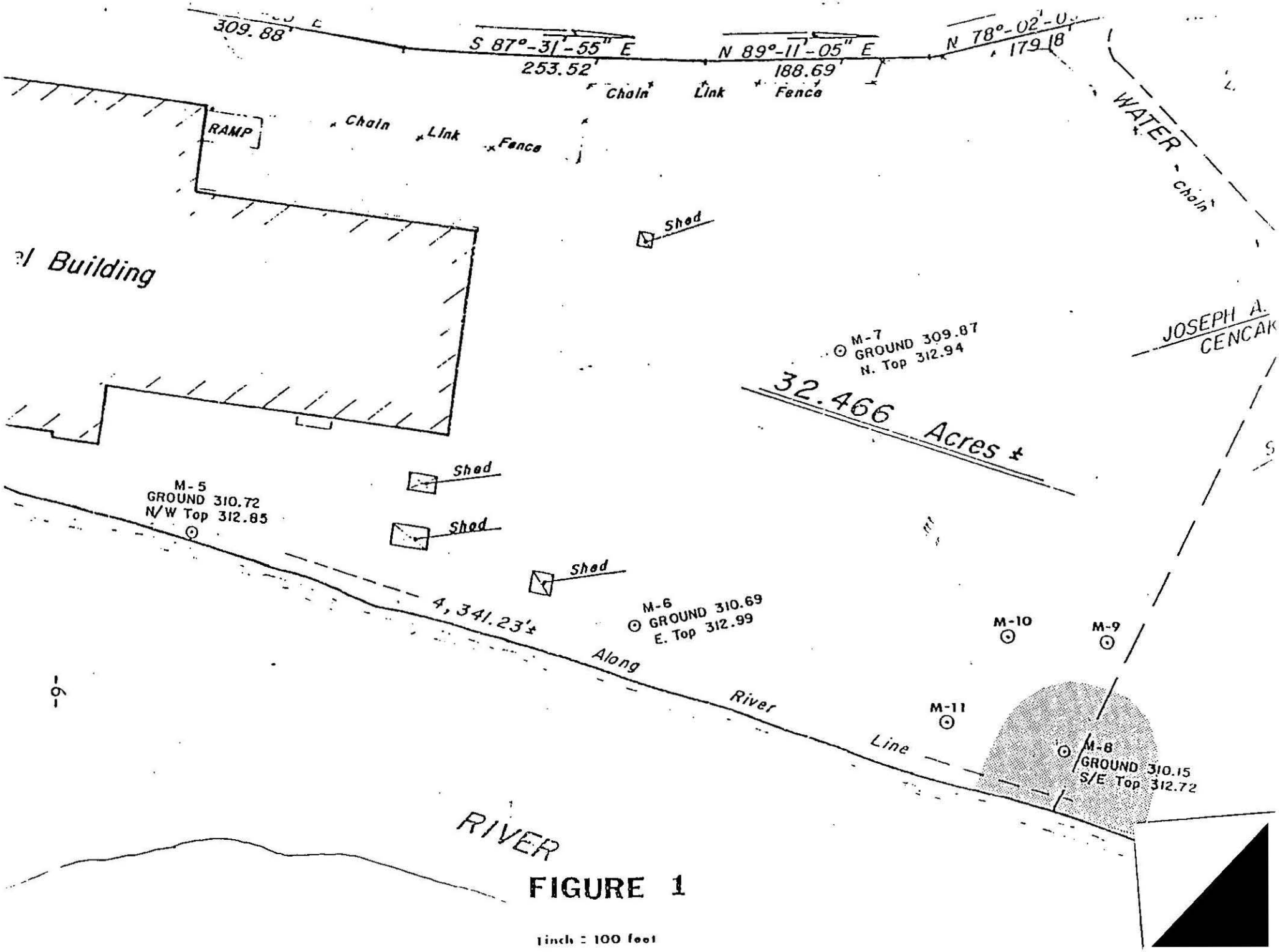

FIGURE 1

1 inch = 100 feet

and VC. Brief descriptions and explanations of these criteria and standards follow the table.

TABLE 3

EXISTING STANDARDS AND CRITERIA

Chemical	MPDWR[1] MCL (mg/l)	TLV[3] TWA (mg/m^3)	CAG[5] (CLASS) (ingestion)	CPI[5] $(mg/kg/day)^{-1}$ (ingestion)	USEPA[5] WQCOW (mg/l)	MAC[6] PFAL (mg/l)
TCE	0.005[2]	270.0	B	0.011	0.0028	45.0
t-DCE	-	790.0	D	-	-	-
VC	0.001[2]	10.0	A	2.30	0.002	-

(1) National Primary Drinking Water Regualtions, Maximum Contaminant levels, 40 CFR 141.

(2) Proposed Maximum Contaminant Levels for the NPDWR, FR 11/25/85.

(3) Threshold Limit Value-Time Weighted Average for inhalation exposure during an 8 hour day, 5 days per week; American Conference of Governmental Industrial Hygienists, 1986-87.

(4) USEPA Carcinogen Assessment Group - Weight of Evidence: A - proven human carcinogen; B - probable human carcinogen; C - possible human carcinogen; D - not enough eveidence to evaluate potential carcinogenicity.

(5) Carcinogenic Potency Index (CPI); Water Quality Criteria for Drink Water (WQCDW) - USEPA Superfund Public Health Evaluation Manual, October 1986.

(6) Maximum Allowable Concentration for Protection of Freshwater Aquatic Life - USEPA Quality Criteria for Water, 1986.

Descriptions of criteria and standards are as follows:

a) National Primary Drinking Water Regulations, 40 CFR 141: These regulations set Recommended Maximum Contaminant Levels (MCLs) for several organic, inorganic, microbiological, and radiological contaminants. RMCLs are the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which includes an adequate margin of safety. RMCLs are non-enforceable health goals. The MCL standards are enforceable only in community water systems and are based both on health-related criteria for long-term, chronic exposure and practical treatment technology currently available. RMCLs and MCLs for eight volatile synthetic organic chemicals were proposed in the Federal Register, November 13, 1985.

b) TLV-TWA (ACGIH, 1986-87): The threshold limit value (TLV)-time weighted average (TWA) of a compound is the average concentration in air for a normal 8-hour work day and a 40-hour work week to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Although the TLVs were not developed to rank relative toxicity of the airborne chemicals, the TLVs represent the most substantial set of health-based criteria for airborne contaminants.

c) Carcinogenic Potency Index (USEPA, 1986a): For many known and suspected carcinogenic substances, a carcinogenic potency index has been developed by the USEPA Carcinogen Assessment Group (CAG).

This index reflects the carcinogenic potential of a unit dose of chemical. It indicates the relative potency of contaminants in inducing cancer, and can therefore be used to develop relative rankings of carcinogens.

d) USEPA Water Quality Criteria (USEPA, 1986b): USEPA Water Quality Criteria specify concentrations of pollutants or pollutant catergories in water which will generally ensure water quality adequate to support a specified water use. The criteria are guidance levels only and have no regulatory impact. Two criteria, representing acute and chronic levels, are presented for freshwater aquatic life.

e) Cancer Risk Value (USEPA, 1986a): This value is the dose (either ingested or inhaled) calculated by the USEPA Carcinogen Assessment Group (CAG) which is expected to result in an increased lifetime risk of cancer of one in an exposed population of 100,000. This risk assessment is based on values of oral (ingestion) or inhalation routes of exposure, where apporpriate.

Toxicity Profiles: The three chemical compounds in question are toxicologically understood and regulated as follows:

a) Trichloroethylene (TCE): Ingestion of large amounts TCE results in vomiting and abdominal pain followed by transient unconsciousness. Prolonged exposure may cause liver damage. Long-term inhalation and ingestion studies with animals have shown evidence of carcinogenicity. The CAG has designated TCE as a Group B - probable human carcinogen (USEPA, 1985a).

The proposed MCL for TCE in drinking water is 5 ug/l. Since this chemical is considered a potential carcinogen, the RMCL is zero. The CAG has estimated that a lifetime cancer risk of 10^{-5} is associated with ingestion of water containing 27 ug/l of TCE.

b) trans-1,2-Dichloroethylene: Little information concerning exposure to trans-1,2-dichlorethylene is available. There are no reports that t-DCE is carcinogenic in humans or animals. Human exposure to high concentrations has been shown to have anesthetic effects as well as nausea, vomiting, weakness, tremor, and cramps. Repeated exposure to high concentrations produced fatty degeneration of the liver in rats (USEPA, 1985a).

A one-day NOAEL for t-DCE has been established by the USEPA Office of Drinking Water. The one-day NOAEL is the concentration of t-DCE in water which results in no observable adverse effects (based on non-carcinogenic end-point of toxicity) assuming that two liters of that water are consumed per day over the course of 10 days. The one-day NOAEL for a 10 kg child is 2.7 mg/l (USEPA, 1985b).

The Office of Drinking Water has also published a Lifetime NOAEL. The Lifetime NOAEL is the amount of t-DCE in water at which, when two liters are ingested per day, over the course of a lifetime, no adverse effect would be observed. The lifetime NOAEL for a 70 kg adult is 0.35 mg/l (USEPA, 1985b).

c) Vinyl Chloride: Most toxicological data about vinyl chloride involves inhalation data only. Short-term high level exposure can produce syptoms of narcosis, respiratory tract irritation, bronchitis, headache, and dizziness in humans. Long-term exposure to vinyl chloride results in liver, cardiovascular and gastrointestinal damage (USEPA, 1985a).

Vinyl chloride is considered a human carcinogen based on extensive studies involving humans and occupational exposure data. It is classified as a Group A - proven human carcinogen by the CAG. The CAG has estimated that a lifetime carcer risk of 10^{-5} is associated with ingestion of water containing 20 ug/l of vinyl chloride. The proposed RMCL is zero based on carcinogenicity, however, the proposed, enforceable, MCL is 1 ug/l.

EXPOSURE ASSESSMENT

POTENTIAL RECEPTORS

Residential and Industrial Community: The area immediately surrounding the ATF/Davidson Arcade facility is fairly densely populated, especially during the work day. Residents and employees of the area could potentially be exposed to volatized air emissions in the vacinity of the contaminated zone. The zone of contamination is relatively isolated, however, with the nearest residences, and businesses being approximately 400 feet to the northeast. Given the dynamics of local groundwater hydraulics, contaminent transport is understood to flow away from residences and comercial/industrial establishments, and toward the Mumford River.

Surface Water: Given the proximity of the known groundwater contamination to the river and groundwater flow direction being toward the river, contamination will undoubtedly discharge to the Mumford River.

EXPOSURE PATHWAYS AND CONCENTRATION ESTIMATES

AIR: Volatile organic contaminants that are present in ground water have relatively high vapor pressures and can potentially evaporate into the atmosphere through soil, or after discharging to surface water.

Once in the air, the contaminants could be transported off-site by winds. The following conservative assumptions were used in calculating possible airborne concentrations of TCE, t-DCE, and VC:

a) Ground water at M-8 contains average concentrations of 0.018 mg/l TCE, 0.842 mg/l t-DCE, and 0.292 mg/l VC. All flux concentrations of these substances has been assumed to volatilize into the atmosphere at the M-8 location.

b) Contaminated groundwater flux to the Mumford River is at a rate of 0.68 liters per minute (0.011 liters/sec) across the plume's down-gradient seepage face. Basic data for this calculations is contained in the October 1985 CEH report, where:

$Q = KiA$

$= (3.28 \times 10^{-5}\ ft/sec)(4.44 \times 10^{-3}\ ft/ft)(2760\ ft^2)$

$= 4.02 \times 10^{-4}\ ft^3/sec$

$Q = 0.68$ liters/minute

where,

$A = Length \times Depth = (138ft)(20\ ft\ assumed) = 2760\ ft^2$

c) The breathing zone of an individual standing downwind is 2 meters from ground surface, with mixing taking place throughout this distance.

d) Average wind speed and direction for the area is 10.2 miles per hour (4.48 meters per second) from the southwest.

e) No dispersion or disipation takes place within or from the 2 meter by 42 meter by 120 meter corridor that separates the zone of contamination from the nearest receptors (residents) to the north-east.

The following calculations conservatively estimate the concentrations of TCE, t-DCE and VC in the air at the nearest long term receptors:

a) <u>TCE</u>:

If: $W_{tce} = (Q)(C_{tce})$

where, W_{tce} = mass flux of TCE in ground water

Q = groundwater flux

C_{tce} = concentration of TCE in ground water

then $W_{tce} = (0.011\ l/sec)(0.018\ mg/l)$

$= \underline{1.98 \times 10^{-4}\ mg/sec}$

and: $Va = (A)(W)$

where, Va = volume flux of air through breathing zone

A = cross sectional area of air flow

W = wind speed

and, A = (42 meters)(2 meters) = 84 square meters

then, $Va = (84\ m^2)(4.48\ m/sec)$

$= \underline{376.32\ m^3/sec}$

and: $B_{tce} = (W_{tce})/Va$

where, B_{tce} = breathing zone concenration of TCE

then, $B_{tce} = (1.98 \times 10^{-4}\ mg/sec)/(376.32\ m^3/sec)$

$= \underline{5.26 \times 10^{-7}\ mg/m^3}$

$= \underline{8.92 \times 10^{-5}\ ppb}$

b) <u>t-DCE</u>:

If: $W_{t\text{-}DCE} = (Q)(C_{t\text{-}DCE})$

where, $W_{t\text{-}DCE}$ = mass flus of t-DCE in ground water

Q = ground water flux

$C_{t\text{-}DCE}$ = concentration of t-DCE in ground water

then, $W_{t\text{-}DCE} = (0.011\ l/sec)(0.842\ mg/l)$

$\underline{9.26 \times 10^{-3}\ mg/sec}$

and: $Va = (A)(W)$

where, Va = volume flux of air through breathing zone
A = cross sectional area of air flow
W = wind speed

and, A = (42 meters)(2 meters) = 84 square meters

then, $Va = (84\ m^2)(4.48\ m/sec)$

$= \underline{376.32\ m^3/sec}$

and: $B_{t\text{-}DCE} = (W_{t\text{-}DCE})/Va$

where, $B_{t\text{-}DCE}$ = breating zone concentration of t-DCE

then, $B_{t\text{-}DCE} = (9.26 \times 10^{-3}\ mg/sec)/(376.32\ m^3/sec)$
$= \underline{2.46 \times 10^{-5}\ mg/m^3}$

$= \underline{6.15 \times 10^{-3}\ ppb}$

c) <u>VC</u>:

If: $W_{vc} = (Q)(C_{vc})$

where, W_{vc} = mass flux of VC in ground water
Q = ground water flux
C_{vc} = concentration of VC in ground water

then, $W_{vc} = (0.011\ l/sec)(0.292\ mg/l)$
$= \underline{3.21 \times 10^{-3}\ mg/sec}$

and: $Va = (A)(W)$

where, Va = volume flux of air through breathing zone
A = cross sectional area of air flow
W = wind speed

and, $A = (42 \text{ meters})(2 \text{ meters}) = 84 \text{ square meters}$

then, $Va = (84 \text{ m}^2)(4.48 \text{ m/sec})$
$= \underline{376.32 \text{ m}^3/\text{sec}}$

and: $B_{vc} = (W_{vc})/Va$

where, B_{vc} = breathing zone concentration of VC
then, $B_{vc} = (3.21 \times 10^{-3} \text{ mg/sec})/(376.32 \text{ m}^3/\text{sec}$
$= \underline{8.53 \times 10^{-6} \text{ mg/m}^3}$

$= \underline{3.36 \times 10^{-3} \text{ ppb}}$

To summarize, conservative average ambient air concentrations of 8.92×10^{-5} ppb of TCE, 6.15×10^{-3} ppb of t-DCE, and 3.36×10^{-3} ppb of VC have been estimated to exist at the nearest receptors to the zone of contamination.

Surface Water: As mentioned, contaminated ground water will discharge to the adjacent Mumford River. Impacts on the water quality of the river can be estimated by calculating a dilution factor that is based upon the ratio of the contaminated ground water flux to the annual average discharge of the Mumford River.

$D_{sw} = (Q_{gw})/(Q_r)$

$= (0.011 \text{ l/sec})/(1269 \text{ l/sec})$

$= 8.70 \times 10^{-6}$

where, D_{sw} = dilution factor
Q_{gw} = ground water flux
Q_r = annual average Mumford River discharge

Based upon the average concentrations derived in Table 1, the concentrations in the river are conservatively estimated as follows:

$$TCE = (18 \text{ ug/l})(8.70 \times 10^{-6}) = \underline{1.56 \times 10^{-4} \text{ ug/l}}$$

$$t\text{-DCE} = (842 \text{ ug/l})(8.70 \times 10^{-6}) = \underline{7.30 \times 10^{-3} \text{ ug/l}}$$

$$VC = (292 \text{ ug/l})(8.70 \times 10^{-6}) = \underline{2.53 \times 10^{-3} \text{ ug/l}}$$

RISK ASSESSMENT

As discussed in the Exposure Assessment section, the primary pathways associated with off-site exposure to TCE, t-DCE and VC are transport by air and surface water. This Risk Assessment section will evaluate the chemical concentration levels estimated to exist within these air and surface water pathways in terms of relevant standards and toxicity criteria.

TCE is considered a Group B (probable human carcinogen) substance, and VC is a Group A (proven human carcinogen) substance. Potential lifetime cancer risks will be calculated for exposure to their estimated pathway concentrations. Because t-DCE is considered a Group D (not enough evidence to evaluate potential carcinogenicity) substance, exposure to its pathway concentration will be evaluated in terms of TLV-TWA criteria (Threshold Limit Value - Time Weighted Average).

AIR: Risks associated with pathway concentrations are estimated assuming a typical 70 kg adult, breathing $20m^3$ of air per day, is living at the site boundry. Potential carcinogenic risks for TCE and VC are calculated as follows:

a) TCE:

$$R_c = (C_{tce})(Pf_{tce})(1/70\ kg)(20\ m^3/day)$$

$$= (5.26 \times 10^{-7}\ mg/m^3) \times (4.6 \times 10^{-3}(mg/kg/day)^{-1}) \times (1/70\ kg) \times (20\ m^3/day)$$

$$= \underline{6.95 \times 10^{-10}}$$

where, R_c = carcinogenic risk
C_{tce} = projected concentration of TCE in air
Pf_{tce} = potency factor of TCE (USEPA)
70kg = average adult weight (USEPA)
20 m^3/day = average amount of air breathed by average adult per day (USEPA)

b) VC:

$$R_c = (C_{vc})(Pf_{vc})(1/70\ kg)(20\ m^3/day)$$

$$= (8.53 \times 10^{-6}\ mg/m^3) \times (2.5 \times 10^{-2}(mg/kg/day)^{-1}) \times (1/70\ kg) \times (20m^3/day)$$

$$= \underline{6.06 \times 10^{-8}}$$

where, R_c = carcinogenic risk
C_{vc} = projected concentration of VC in air
Pf_{vc} = potency factor of VC (USEPA)
70kg = average adult weight (USEPA)
20m^3/day = average amount of air breathed by average adult per day (USEPA)

Table 4 summarizes projected airborne contaminant concentrations, TLV standards and potential lifetime cancer risks.

TABLE 4

AIRBORNE EXPOSURES, STANDARDS AND RISKS

Chemical	Projected Airborne Concentration (ug/m^3)	TLV (ug/m^3)	Potential Lifetime Cancer Risk
TCE	5.26×10^{-4}	2.70×10^{5}	6.95×10^{-10}
t-DCE	2.46×10^{-2}	7.90×10^{5}	—
VC	8.53×10^{-3}	1.00×10^{4}	6.06×10^{-8}

Projected lifetime cancer risks for airborne TCE and VC are both far less than 1 in 1,000,000 which is generally considered statistically insignificant. Projected concentrations of t-DCE, not classified as a carcinogen, are far less than 1/1,000,000 of the TLV; the health risks are also, thusly, not considered significant.

Surface Water: Risks associated with pathway concentrations are estimated assuming a typical 70 kg adult drinks 2 liter/day directly from the Mumford River, adjacent to the discharging zone of contamination. In that the area is served by public water supplies, this is highly unlikely and overly conservative. The point of treating the Mumford as a drinking water source adjacent to the site, however, is to place incidental ingestion by potential recreational users in perspective. Actual risks associated with contact recreation would be expected to be several orders of magnitude below these calculated values; contact would be intermittent, and incidential ingestion would be less than 2 liters per day. Potential carcinogenic risks associated with TCE and VC are calculated as follows:

a) TCE:

$$R_c = (C_{tce}) \times (Pf_{tce}) \times (1/70kg) \times (2 \text{ liter/day})$$

$$=(1.56 \times 10^{-7} mg/l) \times (1.1 \times 10^{-2} (mg/kg/day)^{-1}) \times (1/70kg) \times (2 \text{ liter/day})$$

$$= \underline{4.93 \times 10^{-11}}$$

where, R_c = carcinogenic risk

C_{tce} = projected concentration of TCE
Pf_{tce} = potency factor of TCE (USEPA)
70kg = average adult weight (USEPA)
2 liter/day = average amount of water ingested per day (USEPA)

b) VC:

$$R_c = (C_{vc}) \times (Pf_{vc}) \times (1/70kg) \times (2 \text{ liters/day})$$

$$= (2.53 \times 10^{-6} \text{ mg/l}) \times (2.30 (mg/kg/day)^{-1}) \times (1/70 \text{ kg}) \times (2 \text{ liters/day})$$

$$= \underline{1.69 \times 10^{-7}}$$

where, R_c = carcinogenic risk
C_{vc} = projected concentration of VC
Pf_{vc} = potency factor of VC (USEPA)
70 kg = average adult weight (USEPA)
2 liters/day = average amount of water ingested per day (USEPA)

Table 5 summarizes projected surface water contaminant concentrations, MCL standards, NOAEL standards (t-DCE), and potential lifetime cancer risks.

TABLE 5

SURFACE WATER EXPOSURES, STANDARDS AND RISKS

Chemical	Projected Surface Water Concentration (ug/l)	MCL (ug/l)	NOAEL (ug/l)	Potential Lifetime Cancer Risk
TCE	1.56×10^{-4}	5	-	4.93×10^{-11}
t-DCE	7.30×10^{-3}	-	350	-
VC	2.53×10^{-3}	1	-	1.69×10^{-7}

Projected lifetime cancer risks for daily ingestion of Mumford River water are far less than 1 in 1,000,000 for both TCE and VC; the risks are, therefore, considered statistically insignificant. Projected concentrations of t-DCE, not classified as a carcinogen, are approximately 50,000 times less than the NOAEL (no observable adverse effects level), as set by the USEPA Office of Drinking Water. Health effects are, thusly, considered insignificant.

SUMMARY AND CONCLUSIONS

Although the etiology of contamination in the vacinity of M-8 is undocumented, the aerial extent is localized. Given site security and the existence of public water supplies, the occasions for inadvertant direct exposure seem remote. Whereas the contaminated area lies directly adjacent to the river that receives groundwater discharge, contamination is undoubtedly mixing with surface water.

The noted contaminants, TCE, t-DCE and VC occur in concentrations equal to 1.5%, 73% and 25.5% of the mass balance, respectively. Whether this is indicative of a relatively old or recent incident is unknown. The physical and chemical properties of these compounds, at their noted

concentrations, will tend to make them move with ground water flow. They will ultimately discharge to the Mumford River and volitalize into the atmosphere.

The potential receptors in the area include local residents and employees of local enterprises. Pathways of exposure are through the air, and through contact with the Mumford River. Concentrations of the contaminants are calculated to be very low in both pathways, and the risks associated with exposure are attendantly calculated to be negligable.

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ANALYTICAL RESULTS

ATF - Davidson Property
1 Main Street, Northbridge, MA

10/17/96 + 1/17/97(*)

Well ID	PCE	TCE	1,2-DCE	VCL	Acetone	Barium
M-1	--	--	--	--	--	--
M-2	--	--	--	--	--	--
M-3	ND	3.8	2.6	ND	103.	--
M-4	--	--	--	--	--	--
M-5	--	--	--	--	--	4.63
M-6	93.3	31.4	28.2	17.8	ND	--
M-7(*)	ND	ND	ND	ND	ND	--
M-8	ND	5.1	82.6	62.5	ND	1.05
M-9	52.9	9.8	7.9	ND	ND	--
M-10(*)	ND	ND	ND	ND	ND	--
M-11(*)	ND	ND	ND	ND	ND	--
Geoprobe(*)						Other
SB-1	ND	ND	ND	ND	ND	7.(a)
GP-1	ND	ND	ND	ND	ND	ND
SB-2	ND	ND	ND	ND	290.	8.(a)
GP-2	ND	ND	ND	ND	ND	ND
SB-3	ND	ND	ND	ND	ND	ND
GP-3	ND	ND	ND	ND	ND	ND
SB-4	ND	ND	ND	ND	ND	ND
GP-4	ND	ND	ND	ND	ND	ND
SB-5	ND	ND	ND	ND	200.	22.(a)
GP-5	ND	ND	ND	ND	ND	ND
SB-6	ND	ND	ND	25.	ND	ND
GP-6	ND	ND	50.	74.	ND	7.(b)
SB-7	ND	ND	ND	ND	ND	ND
GP-7	ND	ND	ND	ND	ND	ND

Notes:
- Barium values given in mg/L (ppm).
- All other values given in ug/L (ppb).
- Underlined values exceed MCP Method 1 GW-2/3 limits.
- ND = Below Quantitation Limit.
- -- = Not Sampled.
- SB- = Soil boring
- GP- = Groundwater
- Other: a = Methylene chloride (compound also detected in blank)
  b = 1,2,3-Trichlorobenzene

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